THE MERRILL STORY

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THE MERRILL STORY

(Being a Record of the Life and Achievements of
CHARLES WASHINGTON MERRILL,
and a History of The Merrill Company and Subsidiaries)

by

DAVID W. RYDER

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THE MERRILL COMPANY

1759914

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PREFACE

In the belief that the precious metal mining industry the world over would be interested in the career of the late Charles W. Merrill, metallurgical engineer and founder of The Merrill Company of San Francisco, this book has been written.

It is being distributed not only to the metallurgical engineering profession, but also to those numerous companies throughout the world which have had various kinds of Merrill equipment and processes operating in their plants for many years.

Inasmuch as the purpose of this book is to record the professional achievements and public service of the late Charles Washington Merrill in his rôle as an internationally renowned metallurgical engineer and inventor, and of The Merrill Company and affiliated companies, very little appears in its pages concerning his purely private and personal affairs.

Mr. Merrill was twice married. His first wife was his schoolmate, Clara Scott Robinson, who bore him four children: Beatrice Maud Merrill (Morse); John Lisgar Merrill; Gregor Charles Merrill, and (Dr.) Bruce Robinson Merrill, all of whom are now living. Mrs. Merrill died in 1941. His second marriage was to Mrs. Margaret Barker Cope, who survives him. Of this marriage there were no children.

Besides his widow and four children, Mr. Merrill is survived by eight grandchildren.

Mr. Merrill was one of the founders of the Engineers Club of San Francisco. He was also a member of the Pacific Union Club, University Club and Commonwealth Club of San Francisco; The Recess, the Rocky Mountain Club and the Engineers Club of New York; the Claremont Country Club of Oakland, and the Orinda Country Club of Orinda.

After returning from his ten-years' service at the Homestake Mine in Lead, South Dakota, Mr. Merrill built a home in Berkeley, California, adjoining the Campus of his Alma Mater, the University of California, and lived there for many years. Subsequently, he built at 407 Camino Sobrante in Orinda, California, which was his home at the time of his death in 1956.

San Francisco, 1957 D. W. R.

FOREWORD

Charlie Merrill and I first became friends when he was working for one Janin brother and I was working for another in the 1890's.

My next full contact with him was when he took charge of one of the divisions in the Food Administration for me in 1917. He did a magnificent job.

I tried to get him into the Government in 1928, but his professional obligations prevented it.

His qualities of mind and character, as well as his diversified interest in life, made him fit for great public service. And he gave that service in a multitude of directions all his life.

—HERBERT HOOVER

THE MERRILL STORY

CHARLES WASHINGTON MERRILL
1869-1956

Chapter 1

WHAT'S IN A NAME

WHEN WE FIND events of but two or three decades ago growing somewhat blurred in recollection, and even records of them oft-times in some conflict as to important details, it is not surprising that, on journeying twenty or thirty decades into the dim past, we should find ourselves in a somewhat nebulous region where assured landmarks are few, and even these subject to question.

Thus in our quest for the origin of the Merrill family name—travelling from America to England and from England to France—we are carried back so far in time that what would today be regarded as "legal proofs" are largely non-existent. All we can do, then, is to take the reports which have been handed down to us, frankly admitting that some of them may have gathered to themselves the increments of human hearsay and imagination, but content in the realization that they are scarcely less credible or susceptible of proof than much of what has always gone by the name of history.

With this brief explanation to the reader, we will proceed with the Merrill story.

The Merrills of England, whence came the Merrills of America, were descended of a French Huguenot family named De Merle, who fled their native country to England because of the St. Bartholomew's Day Massacre.

This, it will be remembered, was the unconscionable mass murder of thousands of Huguenots, which started in Paris in the night of August

23-24 (St. Bartholomew's Day), 1572. A large number of prominent Huguenots had been invited to the royal palace to participate in the marriage ceremonies of Henry of Navarre. All unsuspectingly they came, and, while guests in the palace, they were set upon without warning and slaughtered without mercy—as the result of a plot instituted by the anti-Huguenot leaders: Charles IX, the Queen-Mother, Katherine de'Medici, and the Duc de Guise. At a signal, the slaughter of these hapless people spread over the whole city, then throughout France; and estimates of the victims of this terrible and terrifying purge have been placed as high as 100,000.

Somewhat earlier, Protestants had also been viciously persecuted in England, though not in such numbers or with quite such ruthlessness. However, with the succession of Elizabeth to the throne this ceased entirely, and at the time the Merrill family fled France, England was a haven and refuge to them.

In France, the De Merles belonged to the nobility; their ancestral home being the "Place des Dombes" in Auvergne. In England, through the operation of time and phonetics, as well as intermarriage with the English, the family name was Anglicized from the French De Merle to the English Merle and, finally, Merrill. And the family, rooted in the new soil, gained in numbers as well as distinction. As early as 1634 one of its members had been knighted—Sir Peter Merrill—for distinguished service as an officer in the British Army. Others became, over the years, eminent barristers and jurists, as well as respected clergymen and successful farmers. On fleeing France, the Merrills had settled in Salisbury, Wiltshire, and for generations this remained the Merrill family seat.

A year before Peter Merrill became Sir Peter, two other Merrills—the brothers John and Nathaniel—emigrated to the New World. Coming to Ipswich, Massachusetts, in 1633, they were the first Merrills of which there is any record in America. Two years later they moved from Ipswich to Newbury, Mass., and were among the first settlers of that town.

At the time of the arrival of the two Merrill brothers in Ipswich, the first government in Massachusetts—other than that of the Plymouth Settlement's famous "Compact," was just two years old. This govern-

ment was based upon the Charter of 1629, which apparently was intended by the Crown to be merely the charter for a commercial colony. But as if foreshadowing events to come, the resolute colonists boldly transformed it into what amounted to a political constitution.

Under this was created a system of towns, or townships (which might include several villages or settlements), each of which had the right of sending deputies to represent it in the General Court, as the legislature was called. The affairs of the towns, including election of officers and representatives, were conducted at "town meetings"—destined to become famous in early American history—in which all citizens had the right to speak, although the franchise was long limited by religious qualifications. Representative government in Massachusetts is held to date from the year when the General Court was established—1634. At first this was a single body, but in 1644 it was divided into the two chambers which our legislative bodies all have today.

Such, then, was the political situation in Massachusetts when John and Nathaniel Merrill elected to leave England and cast their lot with this little colony on the outskirts of the New World.

Chapter 2

FIRST MERRILLS IN AMERICA

JOHN MERRILL, born in 1608, was married before leaving England. Nathaniel Merrill, two years younger, married Susanna Jourdaine either just before embarking for America or very soon after arrival. Nathaniel and his wife had a family of five sons and one daughter; all born in Ipswich or Newbury, Massachusetts, between 1633 and 1643.

The first son, Nathaniel, Jr., had a son Peter, who married Mary Brown. Peter and Mary had a son named Peter, who married Sarah Hazeltine. Peter and Sarah had a son named John, who married Elizabeth Teppett. John and Elizabeth had a son named Washington, and he married Abiah C. Kelly. Washington and Abiah Merrill had a son named Sylvester, who married Clara Lydia French. To Sylvester and Clara Merrill was born, in Concord, New Hampshire, on December 21, 1869, a son named Charles Washington Merrill, who represented the ninth generation in the United States, and whose life and achievements are the subject of this chronicle.

On his mother's side, Charles Washington Merrill's ancestry likewise was English. Clara Lydia French (his mother) was descended of Anthony Morse, born in Marlborough, England, in 1606, who came to America in 1635 and settled in Newbury, Mass. He had ten children. The first, also named Anthony, married Elizabeth Knight and had eight children. The second of Anthony and Elizabeth Morse's children also was named Anthony. He married Sarah Pike of Newbury, and they had eleven children. Their sixth child was a son named Thomas (afterwards Deacon Morse) and he married Elizabeth Worth of Newbury.

The first of their six children was Thomas, born January 28, 1726, who married Elizabeth Bartlett and resided at Bradford, Mass., where he

The Merrill family Coat-of-Arms

Washington Merrill, grandfather of Charles W. Merrill, 1810-1878

Sylvester Merrill, father of Charles W. Merrill, 1837-1924

was a weaver. The fourth of the eleven sons and daughters of Thomas and Elizabeth Morse was Stephen, born January 28, 1757, who married Sally Kay and resided at Haverhill, Mass. He was a soldier in the Revolution and died in 1843, after fathering twelve sons.

His seventh son was Robert, born July 30, 1792, who married Susanna Haynes and resided in West Rumney, New Hampshire. They had six children. The second of these was Amanda, born April 17, 1817, who married Charles H. French. Of their three children, a daughter—Clara Lydia—married Sylvester Merrill in Concord, New Hampshire, and became the mother of Charles Washington Merrill, named for his two grandfathers.

It will be observed that Charles W. Merrill's first paternal and maternal ancestors to reach America, arrived within two years of each other—Nathaniel Merrill in 1633 and Anthony Morse in 1635, and that they both settled in the same town: Newbury, Mass. This is at least a strange play of fate, and might seem to be more than a mere coincidence. And the town being a small one, it would not seem unreasonable to conjecture that Nathaniel Merrill and Anthony Morse at least knew each other, and may well have been friends. Yet it was eight generations before there was any kinship between them.

Meantime, both the Merrills and the Morses, as we have noted, multiplied rather rapidly. Those were the days of really big families; and again it would not seem improbable that many of the Merrills and the Morses met and mingled with one another—at church, socially, in commerce, and in political and civic affairs. Meantime, also, members of both families played dutiful parts in the life and development of New England. Both Merrills and Morses became town "selectmen" (city or town councilmen today), and were prominent in religious and educational activities. Members of both families fought in the French and Indian war, and later with the Colonial armies in the Revolutionary War.

Both of the grandfathers of Charles W. Merrill were well-known and esteemed in their respective communities.

His mother's father, Charles B. French, was one of the proprietors of the stage line which ran from Concord to the White Mountains, and

later was associated in the building of the first railroad in those parts. He also served as an "Inspector of the Customs."

His paternal grandfather, Washington Merrill, was, to quote from the account of his death in the Methuen, Mass., Journal of 28 September, 1878:

> "a well-known and respected citizen of Methuen, Mass., who endeavored to deal honestly with all men. . . . He succeeded his father in the manufacturing of hats, and in health was a man of great activity and enterprise. Generous and sympathetic, he was ever ready to give and lend, though oftentimes expecting nothing in return. He was public-spirited, interested in everything relating to the growth and prosperity of his native town; especially in the cause of education, at one time even meeting the entire assessment of a new district towards the erection of a convenient schoolhouse."

Washington Merrill's father, John Merrill, had fought under General Washington in the Revolutionary War, and thus it was quite natural that John's first son should be given the name of him who was "first in war, first in peace, and first in the hearts of his countrymen."

Of Washington Merrill's three sons, Sylvester (father of Charles W. Merrill) was born in Methuen, Mass., on November 25, 1837. He attended the public schools of his native town, then entered Phillips Academy.

After graduating from Phillips Academy, Sylvester went to Concord, New Hampshire, where he entered the employ of a furniture manufacturing establishment as a clerk and bookkeeper. There he met and had daily contact with a junior partner in the concern—a man named Nathaniel P. Cole. There is some indication that Cole and young Merrill were distant relatives—possibly by marriage—but of this there is no certainty. Be that as it may, they soon became good friends; and this friendship, as we shall presently learn, was to play a most important part in the subsequent life and career of Sylvester Merrill.

Chapter 3

NEW ENGLAND TO CALIFORNIA

In 1864 the Gold Rush no longer lured hordes of men from all over the world to California. Yet California and the much-sought precious metal were still closely associated in the public mind—for one thing because gold was still being mined in huge quantities in the State, and also because it had been widely proclaimed that the treasure from California was playing such a large part in the financing of the preservation of the Union.

Whether it sprang from this or there was some other more compelling motivation, there is no means of knowing; but in late 1863 or very early 1864, Nathaniel P. Cole took ship from Boston for far-away California and San Francisco. The date of his arrival is not recorded, but it was in time to have his presence certified by a listing in the San Francisco City Directory of 1864. There is no business affiliation or designation accompanying his name; nothing here to indicate why he had made the long trek to this new land; just a one-line listing which reads:

"Cole, Nathaniel P., resides at American Exchange Hotel."

By the following year, however, we are left in no doubt as to his reason for being in San Francisco. In the Directory of 1865-66 we find:

"COLE, N. P. & CO., (O. W. MERRIAM), importers and wholesale dealers furniture, mahogany, etc., 518 Front st.; dwelling 730 Sutter"

From this it is quite apparent that Cole had come to San Francisco to look the new city over from the standpoint of its desirability as a location for a furniture business, and that he had found the situation satisfactory.

As to the exact size of his business, there is no way of knowing, but it was large enough to require the services of a bookkeeper. This is revealed by some further search of the Directory. Looking under the letter, "M," here is the revealing entry:

> "MERRILL, SYLVESTER; bookkeeper with N. P. COLE & CO., dwelling 730 Sutter"

So now we know that some time in the year 1864, or at least early in 1865, Sylvester Merrill followed his good friend, Nathaniel P. Cole, from New England to San Francisco, went to work for him, and lived in his home.

Searching his memory a few months before his death, Charles Washington Merrill believed that he recalled his father relating that even before Cole left for San Francisco, the matter of Sylvester Merrill later joining him had been discussed, and it had been agreed that if Cole found conditions warranted establishing a business there, he would send for young Merrill. This is all the more worthy of belief because it squares up, so to say, so well with the facts.

Charles Merrill easily recalled his father having often spoken of the long and tiresome trip—by ship to Panama, across the Isthmus by slow train in extremely hot weather, and then by ship up the coast to San Francisco. He remembered, too, his father's accounts of his early impressions of San Francisco: of the muddy streets in winter; the sand blowing in his face in summer; the fogs that cleared and sweetened the air; of the strange "Emperor" who walked the streets accompanied by two mongrel dogs; of the elegant stores on Kearny Street, past which throngs of well-dressed men and women paraded on Saturday evenings before theatre-time, and of the many fashionable restaurants where delicacies of all sorts as well as wines of rare vintage were to be had—at a price. To a young New England bookkeeper, trying to get ahead in the world, the price was a formidable barrier. But now and then the Coles took him to dinner at

one of these places and to the theatre afterwards; and on very rare occasions—feeling a bit affluent, or just plain homesick—he forgot thrift for the moment and treated himself to a fine dinner and a ticket to the theatre.

Not often did Sylvester Merrill thus indulge, for by now he had impelling reason to save every cent. That reason, it may not be hard to suspect, was his engagement to a fair young lady back in Concord, New Hampshire; and the less often he dined out and attended the theatre, the sooner could he consummate the marriage both eagerly desired.

Charles W. Merrill chided himself for not being able to recall positively the year his father returned to Concord and married Clara Lydia French. But to the best of his recollection it was 1868; which means that Sylvester Merrill had to repeat, in reverse, the long tiresome trip which had brought him to San Francisco.

The marriage took place in Concord, and, a week or so later, the young Mr. and Mrs. Sylvester Merrill bade goodbye to relatives and friends and journeyed by ship, railroad and ship to San Francisco and their new home.

Bearing out Charles Merrill's recollection that the year of the marriage of his parents was 1868, is the fact that in the San Francisco Directory of 1868-69, the residence of Sylvester Merrill is given as No. 2 Martha Place. In all previous directories he had been listed as residing with N. P. Cole at 730 Sutter. This was evidence that he now had a home of his own; and here the life of the Merrills in the West really begins.

Chapter 4

THE MERRILLS IN SAN FRANCISCO

The San Francisco to which Sylvester Merrill brought his bride in 1868 boasted a population of 147,950 and was thus very much larger than the Concord which she had left. Yet it is not unlikely that this born-and-bred New England young lady found it rather lacking in many of the urbanities she associated with a thoroughly cultivated community. Though the two decades since the Gold Rush had transformed it from a sleepy village into the metropolis of the Far West, and San Francisco had "settled down" considerably and done away with its Vigilance Committees, nevertheless, it still was somewhat on the raucous side, still predominantly a "man's town" where almost "anything went." It was still wanting in that calm tranquility which, by virtue of age and a long-established culture, most New England cities and towns had attained.

Charles W. Merrill did not recall his mother ever saying anything to indicate that she ever disliked San Francisco or was unhappy there. But he did remember that in later years she often spoke of how sedate the city had become to what it had been when she first knew it. He remembered, too, of her telling how frightened she had been at the prospect of travelling some of the steeper streets, and of her remarks about the muddiness of many of them in winter. And to the summer weather she at first had difficulty in growing accustomed. Summer, to her, had always meant hot days, with lovely, long, warm evenings fit for spending in a rocker on the verandah, or in a hammock in the garden. It was hard at first for her to reconcile gray fog swirling in from the ocean—to blot out buildings a few blocks away and put a chill into the evening air that made outdoors unpleasant—with summer.

In after years she had come to laugh about these first reactions to the

city to which her husband had brought her as a new bride, even as she had come to love the cool, gray fog, which cleansed and purified the air and made the sky seem even bluer when the morning sun had burned it away.

There is, however, one thing which shows, even more conclusively than her son's recollections, that, for a time at least, Clara Merrill did not—could not—quite regard San Francisco as *home*. This is the fact that, despite the long, arduous journey it involved, she went "back home"—to Concord—to bear her first child. She made that lonely journey in November, 1869. And although, thanks to "the driving of the last spike" on the transcontinental railroad earlier that year, this was a much quicker trip than the one which brought her out to San Francisco in 1868, it still took ten long days and was far from being what anyone could have rightly termed an enjoyable one. Transcontinental train service in 1869 bore but scant resemblance to that service today.

In November, 1869, Sylvester Merrill was no more than really getting well started in business; hence could not spare either the time or money to accompany his wife to Concord. Thus it is testimony alike to the resourceful and resolute woman she was, and to her strong desire to bear her child in the community her heart still called home, that Clara Merrill made the long journey alone. But she arrived in good health and spirits; and something like one month later—on December 21, 1869—in the Concord house of her parents, Charles Washington Merrill was born.

We can surmise with what ceaseless anxiety Sylvester Merrill, in San Francisco, waited—first for news of his young wife's arrival in Concord, and then of her confinement; and with what relief and joy he learned that the ordeal was over safely, and he was the father of a healthy son. Happy circumstance it was for him that he was exceedingly busy—he was selling by day and helping with the books by night; and that there was also transcontinental telegraph service at the time.

There were two months more of eager and impatient, although less anxious, waiting; and then, about the first of March, 1870, there came one of the happiest days that Sylvester Merrill had ever experienced. On that eventful day the Central Pacific (ancestor of our Southern Pacific),

puffing importantly into its Oakland terminal, brought to him the precious cargo of his returning wife and the son he had never seen.

The son's life-long impressions of his arrival in San Francisco at the age of two and one-half months were never less real and vivid for being what we may term "synthetic." Constructed of his parents' oft-repeated accounts of the happy occasion, the event had been so early and so deeply etched upon the mind of Charles W. Merrill that he could never distinguish it from other early events of his own independent remembrance.

The little house at No. 2 Martha Place (a tiny street on the south side of Geary between Mason and Taylor), where Sylvester and Clara Merrill had lived during their first year in San Francisco was considered rather too small for a family of three. So, while his wife was in Concord, Sylvester searched out a more commodious house at 936 Howard Street, and moved their household wares to it. Here, all things were in order on that memorable day, and here the little family settled down for a year, then moved to a better location at 229 Hayes Street. Two years later, they bought a home of their own at the corner of Fell and Buchanan.

In the meanwhile, Sylvester Merrill continued with the firm of N. P. Cole & Co., whose furniture business was expanding with the rapidly-growing San Francisco. So extensive was the firm's growth—especially in the manufacturing phase of the business—that in 1873 it changed its name to CALIFORNIA FURNITURE MANUFACTURING COMPANY, and, while keeping its factory on Bush Street, opened large salesrooms at 649-651 Market Street. Two years later there was concrete proof that Sylvester Merrill had given a good account of himself in the business. In the San Francisco Directory of 1876 the listing of his firm reads:

> CALIFORNIA FURNITURE MANUFACTURING CO., N. P. Cole, President; Sylvester Merrill, Treasurer; B. P. Moore, Secretary—manufacturers and importers wholesale and retail furniture, 220-226 Bush and 649-651 Market.

This signal mark of Sylvester Merrill's success leads us to surmise that neither he nor his wife by now regretted, if they ever had, removing from New England and casting their lot with the young City of Saint Francis.

Chapter 5

THE SAN FRANCISCO OF THE MERRILLS

DATES ARE AS MILEPOSTS along the broad highway of Time, certain ones of them conjuring up images which draw our attention to and illuminate specific areas of the past.

Thus it is that the period surrounded by the dates 1869 and 1879, since it was an important one in the history of San Francisco, and because it embraces the first decade in the life of Charles Washington Merrill, summons our special interest.

What were some of the most distinctive and noteworthy happenings in the life of San Francisco during this period?

For one thing, the era witnessed the arrival of the first trains of the transcontinental railroad. Through the operation of time, memories of the almost incredible Pony Express and Overland Stage, which preceded the trains, have now been dimmed. Yet until May, 1869, when, with the "driving of the last spike" at Promontory, Utah, San Francisco and the Eastern seaboard were bound together with bands of steel, those two typically American pioneer institutions—the Express and the Stage—had provided the only means of regularly transporting first class mail, by land, between the East and the West. And so it was that when the first transcontinental train "came thundering down the Sacramento Valley with its freight of Eastern passengers," the people of San Francisco—Sylvester and Clara Merrill among them—held a three-day celebration to commemorate the ending of one era and the beginning of another.

It was likewise during these years that two eminent San Franciscans—

Sharon and Ralston—began and completed the world's largest and costliest hostelry—the original Palace Hotel. Into its construction, we are told, went over 30,000,000 bricks, 10,000,000 feet of lumber, 32,000 barrels of cement, and 48 miles of water and gas pipes; and, besides its numerous and elegantly furnished public rooms, it had 1,000 bedrooms. Commenced in 1871, it was opened in 1876, and quickly its glory travelled around the world.

The opening of The Palace was soon followed by that of The Baldwin, standing where the Flood Building is today. Built by the fantastic "Lucky" Baldwin with part of the huge fortune he gained from the Nevada mines, it was smaller than The Palace, but atoned for that by containing a theatre which claimed to be "the costliest and most beautiful in the world." (Superlatives seem to have been no less prevalent then than now.)

This was the decade when the people of San Francisco looked with awe and wonder at their first electric lights, and listened, dumfounded, to the ring of their first telephone bell.

The electric lights shone out of three French arc lamps which were exhibited atop old St. Ignatius College (where The Emporium is now), during the week-long celebration San Francisco held to commemorate the 100th Anniversary of the signing of The Declaration of Independence. The current was generated by some old machines claimed to have been originally used in the siege of Paris.

The telephone, which had been demonstrated in Philadelphia several years earlier, reached San Francisco in 1879. Its local sponsor and entrepreneur was the Pacific Bell Telephone Company, whose first San Francisco telephone directory—presaging the beginning of the end of that fine old institution, the Messenger Boy—listed a grand total of 170 names. (Incidentally, the inventor of the telegraph—Samuel F. B. Morse—was related to Charles W. Merrill, through the latter's maternal great-grandfather, Robert Morse.)

It was this self-same decade which saw a San Franciscan make history by what he did with a wire rope. This was A. S. Halladie, and in 1872 he used some of the product, which he had long been manufacturing, to

haul a passenger-carrying contraption of his invention up and down the steepest hills in San Francisco. That was the first cable-car in the world, and it revolutionized streetcar transportation, particularly in hilly cities.

There were numerous other events of significance occurring during the first decade of Charles Merrill's life in San Francisco, and perhaps a brief calendar of some of them may be of interest.

In the season of 1869-1870 the famous old California Theatre opened its doors. Managed by John McCullough, himself a famous actor of the era, it brought San Franciscans their earliest first-class productions of such dramas as "Hamlet," "Richard III," "Richelieu," "Monte Cristo," and "Solid Silver"—the latter authored by the eminent San Francisco attorney, W. H. L. Barnes, who also enacted a prominent rôle in it.

In 1871 the *Post,* ancestrally related to today's *Call-Bulletin,* was started by J. T. Goodwin, who is given the distinction of having "discovered" Mark Twain and induced him to enter journalism.

In 1870, *The Overland Monthly,* born only a year or so earlier in San Francisco, made itself nationally and internationally renowned through publishing Bret Harte's unusual poem, "The Heathen Chinee."

In 1871 the San Francisco Art Association came into being; numbering amongst its early members two painters who were to achieve world acclaim—William Coulter and William Keith.

In 1875 Lotta Crabtree—the dearly beloved entertainer, "Lotta," of the Gold Rush era—presented to San Francisco as a mark of her affection and gratitude, the drinking fountain which still stands at Market, Kearny and Geary streets as an historical landmark.

In 1877 the San Francisco Committee of Safety was organized, with 6,000 members. It's chairman was William T. Coleman, prominent merchant, but probably better known to history as head of the San Francisco Vigilance Committee of 1856. With Dennis Kearney and his cohorts of his recently-organized "Workingmen's Party" on the march—especially against the Chinese, whom they condemned as the source of all economic evil—mobs and street rioting became so prevalent that it seemed for a time as if vigilante methods might have to be revived to prevent wholesale violence. Fortunately, however, memories of the operations

of the Vigilance Committee of 1856 were still vivid; consequently the mere coming into being of an organization of 6,000 citizens of all walks of life pledged to do whatever might be necessary to enforce the laws, rendered further action unnecessary. Order was restored and maintained.

Finally, this was the decade in which death brought to a close the benign "reign" of that gentle impostor and bizarre character, whose fame spread round the world—"Emperor" Norton. San Francisco was the origin and seat of his "empire," and San Francisco—by happily and graciously humoring his every whimsical or exalted pretense—exalted and ennobled itself by a display of collective kindheartedness that probably no other great city has ever demonstrated. Sylvester Merrill knew the old "Emperor," because, as Treasurer of one of the business firms occasionally called on by him to pay "taxes," his was the duty of honoring the "Emperor's" imperial levies—usually for no more than two dollars, but sometimes for as much as five. To his son, Sylvester Merrill related stories of the kingly and kindly old man, with his garish uniform, his two dog-companions, Bummer and Lazarus, and his many eminently sane and practical ideas—as for instance, the bridging of San Francisco Bay! Charles Merrill only faintly remembered "Emperor" Norton, because, he had chanced to see him only once, and that as a boy of six or seven. But he recalled vividly his father's tales of how the City pretended to take seriously this aberrant old gentleman, and, through these tales, imbibed some of the spirit that prompted 30,000 San Franciscans to attend his funeral ceremonies in January, 1880.

This, then, was the San Francisco that Sylvester and Clara Merrill knew during their first ten years together; this was the San Francisco in which their son grew from infancy into boyhood and began to go to school, and this was the decade which transformed them from New Englanders into Californians.

At the end of this decade—believing that a smaller community would provide more room (and more fun) for a lusty, growing boy, and wanting to have space for such things as lawns and gardens and fruit trees—Sylvester and Clara Merrill sold their house in San Francisco and moved across the Bay to the little residential town of Alameda, which was destined to be their home for the remainder of their lives.

Chapter 6

SCHOOL AND COLLEGE

HAVING SETTLED with his family in Alameda, Sylvester Merrill now joined the growing ranks of "commuters"—a designation then only in its infancy—daily riding the trains and ferryboats to and from his business in San Francisco. And the boy—Charles to his mother and father, but Charlie or "Chuck" to his playmates—grew up in the traditional American manner. He went to the Alameda public schools—grammar and high school; he had a pony and went riding frequently with other boys his age; he played baseball and tennis; he learned to swim at the Alameda beaches, and, in the long summer vacations, hiked in the Santa Cruz Mountains where his parents had built a summer home. In his 86th year—reminiscing of his boyhood and early youth—Charles Merrill recalled fragrantly the pastimes in which he indulged in those days, laying particular stress on the pleasures he derived from swimming and baseball, and from hiking the steep trails and picking wild strawberries amidst the tall redwoods of the Santa Cruz Mountains.

At the age of seventeen, "Chuck" Merrill graduated from the Alameda High School, and in the Fall of the same year—1887—entered the University of California, registering in the College of Mines. According to his recollection in later years, no one specific thing induced him to decide upon metallurgy and mining as a life career. As he remembered, he had *always* had that ambition; so, when he finished high school, there was never any indecision, no weighing of the pros and cons—he knew exactly what he wanted to be and do, and set out forthwith to prepare himself for it.

It is hardly necessary to say that in many respects the University of California in the year 1887 bore but scant resemblance to that institution today. Incredible as it now may seem, there were only 89 students enrolled in young Merrill's freshman class; only 229 in the entire university! And the whole Faculty numbered only about 90. Yet in one respect it was the same then as now—a first rate university, with a College of Mines second to none. Moreover, although the number participating in it has of course enormously increased in the past seventy years, college life, as one learns of it from those who then lived it, was much the same as now. Looking over the "Blue and Gold"—the class Year Book—brought out by Charles Merrill's class, one is so struck by the similarities of the "then and now" as to invoke the old French aphorism: *"Plus ca change, plus ca c'est la meme chose."* Of course the college jokes of 1887 seem dated and anything but funny now, but the quality of the humor and its main purpose—to deflate the "stuffed shirts" on the campus and to spoof good-naturedly members of the Faculty and others in authority, was the same.

Probably athletics, in the years 1887 to 1891, occupied a less conspicuous place than they do now at the University of California, but no doubt one reason for this was that the small number of students then did not afford sufficient material. To be sure, there was not nearly so much of quantity in athletics then, but what there was rated a good deal of prominence—as instanced by the space devoted to it in the "Blue and Gold" of those now distant years.

With such a small student body, there naturally were small classes, thus more opportunity then than now for students and their professors to have close contacts; and, in reminiscing of his college life, Charles Merrill was inclined to feel that "perhaps it was easier for one to get a well-rounded education in my day than at present." In this respect, he emphasized especially the benefits flowing to the student from a kind of "fellowship of learning" which accrued of professors and students becoming intimately acquainted. This made for a relationship, he pointed out, somewhat comparable to that between Socrates and his students. "We greatly respected our professors," he remarked, "but that did not make us stand in awe of them. Knowing them so well, we never were afraid to ask questions or even to argue with them at times."

In the light of his subsequent career, it admits of no doubt that Charlie Merrill was an industrious student. However, he was far from being a "grind"; and devotion to studies did not preclude a full program of extracurricular activities. He participated in all phases of college social life; he played in tennis matches; he was on his class baseball nine, and he was editor of the "Blue and Gold" brought out by his class.

Asked if he recalled anything of especial significance concerning his college days, he thought a few moments and then said: "Well, of course there were lots of things that seemed important at the time, and it would take too long to go into them all. But this is something that has always stood out. When I was a junior I became well acquainted with Professor Charles Mills Gayley, through taking a course he gave in English Literature. He was a very wonderful man, as brilliant as he was kindly. I can remember him vividly now, with his shock of red hair and beard to match; and I recall his saying to the class one day: 'My dear young friends, work is a *very* important thing—in college and in life.' Then he paused a minute, with a twinkle in his eyes, and went on: 'But fun is also very important, so try to have a little fun every day.' I took that advice to heart, and always tried to follow it; and besides the enjoyment that I got from the fun, I'm sure it improved my work and greatly prolonged my life."

Other professors that Charlie Merrill recalled affectionately and as having left their impress upon him in one way or another were the two Le Contes—John and Joseph; E. W. Hilgard, head of the Department of Agriculture; Frederick Slate, later Chairman of the Physics Department; Irving Stringham, head of Mathematics; Martin Kellogg, Professor of Latin and the only survivor of the College of California, which had started in Oakland and was the predecessor of the University of California; Professor Christy, head of the Mining Department; George H. Howson, Professor of Philosophy, and William Carey Jones, Professor of United States History.

At the time the Class of 1891 entered the University, Edward Singleton Holden was President. It was he who directed the building of the Lick Observatory, and he subsequently resigned the presidency of U. C. to become its Director. He was succeeded as President by Horace Davis, a

graduate of Harvard and at one time head of a large business enterprise—the Golden Gate Flour Mills.

Classmates of Charlie Merrill's who gained prominence in various walks of life in later years included Fred Juilliard, nephew of the founder, who became head of the Juilliard School of Music in New York; H. B. Montague, whose father, S. S. Montague, succeeded Benjamin P. Judah as Chief Engineer of the Central Pacific Railroad; D. L. Beard, successful merchant of Napa; Charles H. Bentley (brother of Robert I. Bentley), who became Vice President and Sales Manager of California Packing Corporation; A. L. Ehrman, at first associated with his father in the large wholesale grocery firm which sold out to S & W, and later entering the bond and stock business in San Francisco; Thomas Ransom, mechanical engineer, who first worked at the old Union Iron Works and then established his own engineering firm; William H. Waste, who, starting as a reporter for the Oakland *Tribune,* studied and practiced law, became a superior judge of Alameda County, then an Associate Justice of the California Supreme Court and finally Chief Justice; Warren Olney, Jr., long an eminent attorney in San Francisco, who served a term as Associate Justice of the California Supreme Court; Harry Ainsworth, who became Vice President of Wells Fargo Bank & Union Trust Company, and his brother, John Ainsworth, who for many years was president of the U. S. National Bank of Portland, Oregon; Joseph N. LeConte, son of Professor Joseph LeConte, who first taught at Cornell University for two years, then joined the Faculty of the University of California, later becoming head of its Electrical Engineering Department; William G. Morrow, first associated with his father in various mining concerns, later going into the cattle business with his brother and becoming manager of the big Morrow Brothers cattle ranch on Mount Hamilton; Leslie Simpson, who gained fame and wealth as one of the leading mining engineers of South Africa, later returning to San Francisco and by his benefaction making possible Simpson Hall at the California Academy of Sciences in Golden Gate Park, and Anson S. Blake, who became a successful business man, and whose interest in early California history led him to write extensively on the subject and to serve for years as President of the California His-

Charles W. Merrill on the University of California Tennis Courts in the 1890's.

torical Society. Mr. Blake has been for many years Secretary of the Class of 1891 and, as this is written, is one of the three surviving members of that class. Blessed with a splendid memory, he has put the author much in his debt by his lively and varied recollections of campus activities at the University of California while the Class of 1891 was there. With most of these college companions, Charles Merrill maintained lifelong friendship, and survived all but seven of them.

In the Commencement exercises of May, 1891, Charles Washington Merrill, aged twenty-one, was graduated by the University of California, with the degree of BS in metallurgy and mining, and immediately set forth to practice his profession.

Chapter 7

THE YOUNG METALLURGIST

It has been observed earlier that, long before he registered in the College of Mines at the University of California, Charlie Merrill knew exactly what he wanted to be and do in life. Throughout his four years in college this resolution never wavered; hence it is no surprise to find that on graduation he lost no time in setting out to do that for which he had prepared himself. Indeed, within two or three weeks after saying goodbye to the Campus, he had a job.

It was not a very big or important job, and it lasted only a few months. But it was work, and work in the general field of his studies. Dr. George F. Becker was, at the time, one of the top men in the U. S. Geological Survey; and, learning that he needed a sort of "roustabout" or man of all work, young Merrill applied to him for the job and got it. The locale was the Sierra Nevada Mountains, and during the Summer and early Fall of 1891 he made himself useful to Dr. Becker in every way possible.

Winter frequently arrives early in the high Sierra, so in October this job terminated and the youthful metallurgist returned to San Francisco. There, by means of a letter from an old friend of his father's, he was introduced to Alexis Janin, an eminent metallurgical engineer of the time, and went to work for him in November, 1891. Alexis Janin's brother, Louis, was a mining engineer and equally distinguished, and these two men, with offices in San Francisco, enjoyed a very wide practice. In connection with his office, Alexis Janin had a laboratory for testing and studying ores, and in this laboratory Charles Merrill worked. He lived

IN DIVERSIS VERSATI
IN UNUM VERSI
University of California.
By authority of the State of California, have conferred the degree of
Bachelor of Science with all the rights and privileges thereto pertaining on
Charles Washington Merrill,
a student in the College of Mining, who has been examined by the appropriate
Faculty and presented to the Regents as worthy to be admitted to the honor of said degree.
In Witness Whereof, the Regents of the University of California have caused
their official Seal and the signatures of their officers to be hereto affixed.
Dated at Berkeley the seat of the University this twenty third day of
June in the year of Eighteen hundred and ninety one.
Professors
Instructors
of the
University

The University of California conferred the Degree of Bachelor of Science in the College of Mining on Charles W. Merrill, June 3, 1891.

with his parents in Alameda, joining his father as a daily commuter to and from San Francisco.

As an assistant to Alexis Janin, young Merrill did whatever he was directed to do, and that he did it well is attested by the following excerpts from a letter written him by his employer. Dated at Santa Barbara, California, February 14, 1893, this letter reads in part as follows:

"My dear Merrill:

That was a nice, breezy letter of yours of the 7th inst. If I am to judge from what you tell me, I think you have acted very wisely . . .

Now let other young men take warning from your course. You have always showed a desire to learn, to assist your elders in your chosen profession with vim and intelligence, to do what they required of you with no assertion of under pay—gaining experience, profiting by their advice and, in return, being helped by them as occasion permitted. Young men, as we old men know, are generally fools, but it is quite permissible in the young to be fools, provided that they recognize the fact before it is too late. That was the trouble with various young fellows whom I have tried to keep—that is, they thought they knew it all at the very start, and, after many years, they are where they began. One has to drop such a fool. I have no doubt but that you will soon be in a fair way to earn a good professional living and gain reputation. Business brings business . . . and others will be after you. Don't be in a hurry to take hold of a new thing until you have thoroughly mastered it. Then you will know the condition necessary to make a success, and, as a new broom, you can demand the proper assistance, and get it. There are sometimes *old* fools. Directors of a Company are generally old and also fools. I have more than once put things over merely because, as expert, I had the authority to bring about changes which were denied to a superintendent, though he was more capable than myself. This is human nature,

> of which there is a great deal among men. . . . My sons are with me, very much worried as to their future. They have nothing to do as I manage the ranch. I am trying to force them to study—they have both shown fair ability. Perhaps some of these days you can give one of them a helping hand. Wishing you much luck,
>
> Yours very truly,
> A. Janin."

It seems abundantly evident that Alexis Janin did not consider Charles Merrill, however young, a fool, and had for him, besides appreciation of his ability and willingness to work, a genuine affection.

Under the arrangement he had with Janin, Merrill was permitted to use the Janin laboratory for his own purposes in spare time; and, since he had written his graduation thesis on the Cyanide Process of recovering gold from its ores, he now devoted his attention, whenever opportunity afforded, to studying and experimenting with this process. By sometime early in 1893—probably about the time of the letter above quoted—he had become convinced that the process, properly applied and developed, had excellent and wide possibilities, and so resigned his job with Alexis Janin to strike out on his own. There was a small office on an upper floor of the building at 117-121 Geary Street, San Francisco, where the furniture firm of which his father was Treasurer was located; and, renting this room, the young metallurgist had his name inscribed on the door, bought a desk and several chairs, and was ready for business.

It was characteristic of Charles Merrill not to try to remember what he considered unessential things, so the exact date of the opening of his first office is not known. He felt certain the year was 1893—probably toward the middle of the year, but could not be sure of the month. In any event, the San Francisco Directory of 1894 contains this listing:

> "Merrill, Charles W., mining; office 117 Geary St., res. Alameda."

As he kept no diary, and again had not considered it of any importance,

Mr. Merrill did not recall, after the lapse of some sixty years, how long he maintained his first office in San Francisco—it might have been two years or three. However, here, once more, the Directory comes to our aid. In the issue of 1895 he is listed exactly as in 1894, but in the issue of 1896 his name does not appear. From this it would seem that he gave up this office late in 1895. Moreover, this hypothesis is supported by the fact that he had already undertaken assignments for the Standard Consolidated Mine at Bodie, California—one of the rich and old gold mines of the State, and at Harqua Hala, Arizona.

Confident by now that a proper commercial application of the improvements he had worked out in the Cyanide Process would enable it to prove its practicability, and knowing that the tailings at Standard Consolidated Mine were rich in unrecovered gold, he went there and proposed the erection of an experimental plant to test the process. The Superintendent—Thomas H. Leggett—an eminent mining engineer, listened attentively, asked a multitude of pertinent questions and, finally, was sufficiently convinced to order erection of the plant.

At this juncture it should be explained that Charles Merrill never claimed to have discovered or invented the original of the Cyanide Process. It had been originated earlier in a relatively crude way by English engineers, but all attempts to introduce it successfully in this country had proved abortive. It was in the development and application of the process that Merrill believed he had discovered vital improvements; and it is apparent that he must have demonstrated this very conclusively to Superintendent Leggett at Bodie. Otherwise, in view of past failures with the original, or English, process, Leggett certainly would not have risked the capital required to build the experimental plant that Merrill proposed.

It is worthy of mention that in this, as in subsequent efforts to introduce his inventions, processes, developments, etc., Charles Merrill had the complete courage of his convictions. Possibly that was because he was so certain he knew what he was doing. In any event, he always was willing to risk his time and effort, and sought no financial recompense unless and until his process proved itself, by actual demonstration, capable of doing all that he represented it would do. Thus it was that in his negotiations

with Superintendent Leggett at Bodie, he willingly agreed that unless his application of the Cyanide Process worked, he was to get nothing for his time and efforts.

When queried concerning this practice, Merrill remarked: "Well, I always believed in that old adage, 'nothing ventured nothing gained.' However, I never ventured until I was as certain as it was humanly possible to be that I knew what I was doing. Mind you, I'm not talking about 'cock-sureness'; that is something entirely different. What I mean is that I was *sure* because I had tested the thing out, not once or twice but dozens of times in every possible way. Of course, even then there was the risk accruing from the intangibles, but such risk I was always willing to run."

At Bodie the results very quickly demonstrated that Merrill knew what he was doing. The experimental plant proved the Merrill Cyanide Process to be such a success that he was hired to superintend the erection of a large commercial plant, to install the Merrill Process and to direct its operations.

The young metallurgist was now on his way!

Chapter 8

CLIMBING THE LADDER

In music, in poetry and often in painting it is not at all uncommon for men to achieve distinction and renown at an early age. In music, particularly, both in composing and performing, youthful eminence is so frequent as to excite little comment. But in the fields of science this usually is not the case. Thus, it was a mark of rare native ability, almost shall we say of genius, that a young man of twenty-four should have developed a very successful process of cyanidation for gold recovery, when so many other men—and older ones—had tried it and failed. Yet that is what the twenty-four-year-old Charles Washington Merrill, only three years out of college, did. Indeed, even earlier—when he was but twenty-three—he had worked out his improvements in the Cyanide Process to the point where he was certain in his own mind that they were valid. However, this was still theory; he still had to demonstrate—to prove them—in a practical test.

This he did, and conclusively, at the Standard Consolidated Mining Company's works at Bodie, California, as already related. It was proven now that the Merrill Process of Cyanidation would do all that its originator and developer claimed for it, and more.

From approximately March, 1893, until about July or August, 1894—something like a year and a half as nearly as can be determined—Merrill continued his work at Bodie, California; and then, his work there completed, returned to San Francisco. But only briefly. Already, reports of his accomplishments with cyanidation had started on the journey that ulti-

mately was to carry them to the farthest reaches of the globe, and he had no more than time to spend a week or so with his parents before he received an invitation from the famous Harqua Hala gold mine in Arizona Territory to discuss his Cyanide Process with its officials.

Naturally, he accepted the invitation with enthusiasm. Visiting the mine, he described his process fully to its Superintendent, Robert M. Raymond, and then spent some time in examining and variously testing the tailings. At the conclusion of his tests he was convinced that his Cyanide Process would operate there as successfully as at the Standard Consolidated Mine at Bodie, and proposed to Superintendent Raymond that an experimental plant be built—again specifying that if his process did not prove out, he should be paid nothing for his time and effort. Superintendent Raymond agreed, and the experimental plant was built at once.

The reader probably will not be surprised to learn that the experimental plant proved that the Harqua Hala's tailings could be successfully worked. Indeed, the tests proved out so well that the mine owners lost no time in erecting a large commercial plant; and again, as at Bodie, Merrill was employed as Chief Metallurgist to direct its operations.

At the Harqua Hala mine Merrill was engaged for approximately two years, 1894-1895, and some sixty years later, in discussing this experience, said he still could "feel" the terrible desert heat he had to endure throughout the Summer—the mine was located near Yuma, Arizona, one of the hottest of habitable places, and long before air-conditioning was even dreamed of. There were days during July and August, he said, when you literally could fry an egg simply by putting it on the cement sidewalk in front of the mine office, and it was only slightly less hot indoors. But he knew that he was making a name for his Cyanide Process, that, as Alexis Janin had written him, "Business brings business," so he endured the heat uncomplainingly and, by dint of steady application and further experimentation, worked out further improvements in what already was coming to be spoken of as the "Merrill Cyanidation Process."

It is a common saying that "bad news travels fast," and undoubtedly plenty of evidence can be amassed to prove it. However, evidence is not wanting that good news also travels rapidly and far, as instanced by what

happened when gold was discovered in then remote California. Though naturally not on so large a scale, this likewise proved true with respect to Charles Merrill's success in working the tailings at Standard Consolidated Mine in California and Harqua Hala in Arizona.

While still employed at Harqua Hala, Merrill received word through two friends of his—Messrs. Wartenweiler and Bratnober, both mining engineers—that the English-owned Montana Mining Company at Marysville, Montana, had learned of his Cyanide Process and were very much interested in determining whether or not it could be successfully applied at their mine. Both Wartenweiler and Bratnober were familiar with the ores of this mine, and told Merrill they believed his process could be successfully used to work its tailings.

By this time Merrill had just about completed his work at Harqua Hala, so soon thereafter he made a trip to Marysville, Montana. There, after prolonged discussion with General Manager A. T. Bayliss, he made his tests of the tailings, and was convinced that his process could be used on them profitably. He so reported to Bayliss and, as at Bodie and Harqua Hala, proposed an experimental plant. Bayliss agreed, and the plant demonstrated conclusively that the tailings could be reworked at a good profit. Accordingly, a large operating plant was erected, of which Merrill was put in charge as Resident Metallurgical Engineer.

For two years he continued in this capacity, and of this assignment it was the cold, rather than heat, that he always remembered. Located near the Continental Divide, at an elevation of over 11,000 feet, the mine had to shut down during part of the Winter because of the bitter cold, since most of its works were in the open. To the end of his life Merrill still could recall this bitter cold, which penetrated even the stoutest clothing and "chilled your very bones." Some years, he said, it would come on earlier than normal—before their customary time for shutting down; and once a veritable arctic wave arrived so early and hit so suddenly that "they had to pry some of the 'sluicers'—rugged Norwegians—from the side of the treatment tanks and bring them into the boiler room to thaw out."

As the desert heat at Harqua Hala had not deterred the young metallurgist, neither did the cold of the high Rockies—he was engrossed in his

work, and inspired and energized by the effectiveness of his Processes. As this was now its third successful application, he reasoned that it could undoubtedly be used effectively in a vast number of mines in this and other countries. So, at the end of approximately two years as Resident Metallurgical Engineer for Montana Mining Company and with the feeling that, in the words of his friend and preceptor, Alexis Janin, he now knew the "conditions necessary to make a success," he relinquished this position, agreeing, however, to act as Consultant for another three years.

Returning to San Francisco in November, 1897, Charles Merrill turned his thoughts away from mines and ores, and made preparations to enter a new and different field—matrimony.

On February 9, 1898, in a very simple ceremony which took place in Alameda, Charles Washington Merrill and Clara Scott Robinson, who had known each other since their high school days together, were married by Rev. J. F. Moody of the First Baptist Church of Alameda.

Chapter 9

NEW WORLDS TO CONQUER

LOOKING BACK through more than six decades over the career of Charles Washington Merrill, it seems to his chronicler that from the time of his very first metallurgical excursions, destiny had marked him for pre-eminent achievement. Reflecting upon the nature and results of his earliest ventures in this field, one is tempted to say—at least to proffer the suggestion—that his success was fore-ordained; that he was Providentially directed to set foot upon the road which, with but few turns and no digressions, was to carry him along to steadily increasing accomplishment, thereby to bring him fame and fortune.

A scientific man, with a scientific mind, and ever a person of great modesty, he probably would have been the first to deny the allegation that he had been especially chosen for the work he was to perform, and to have given the credit for his achievements to luck or chance.

There is, of course, no way of proving either of these contentions; both must remain forever—as so many other things about which man disputes—in the realm of conjecture. The fact remains, however, that one cannot read the record of Merrill's steady step-by-step progress up the ladder of accomplishment without remarking the unqualified sureness, the calm certainty with which he took each successive step. Perhaps, though signs of it there are none, luck or chance or fortuitous circumstance—call it what you will—did play a part at times; nevertheless, it is plain from the first that here was a man who knew exactly where he wanted to go, and seemed to know precisely how to get there. For whereas

many men who ultimately gain their goals do so by routes uncertainly meandering, Merrill proceeded toward his by a straight and certain path, unshadowed by doubt or deviation.

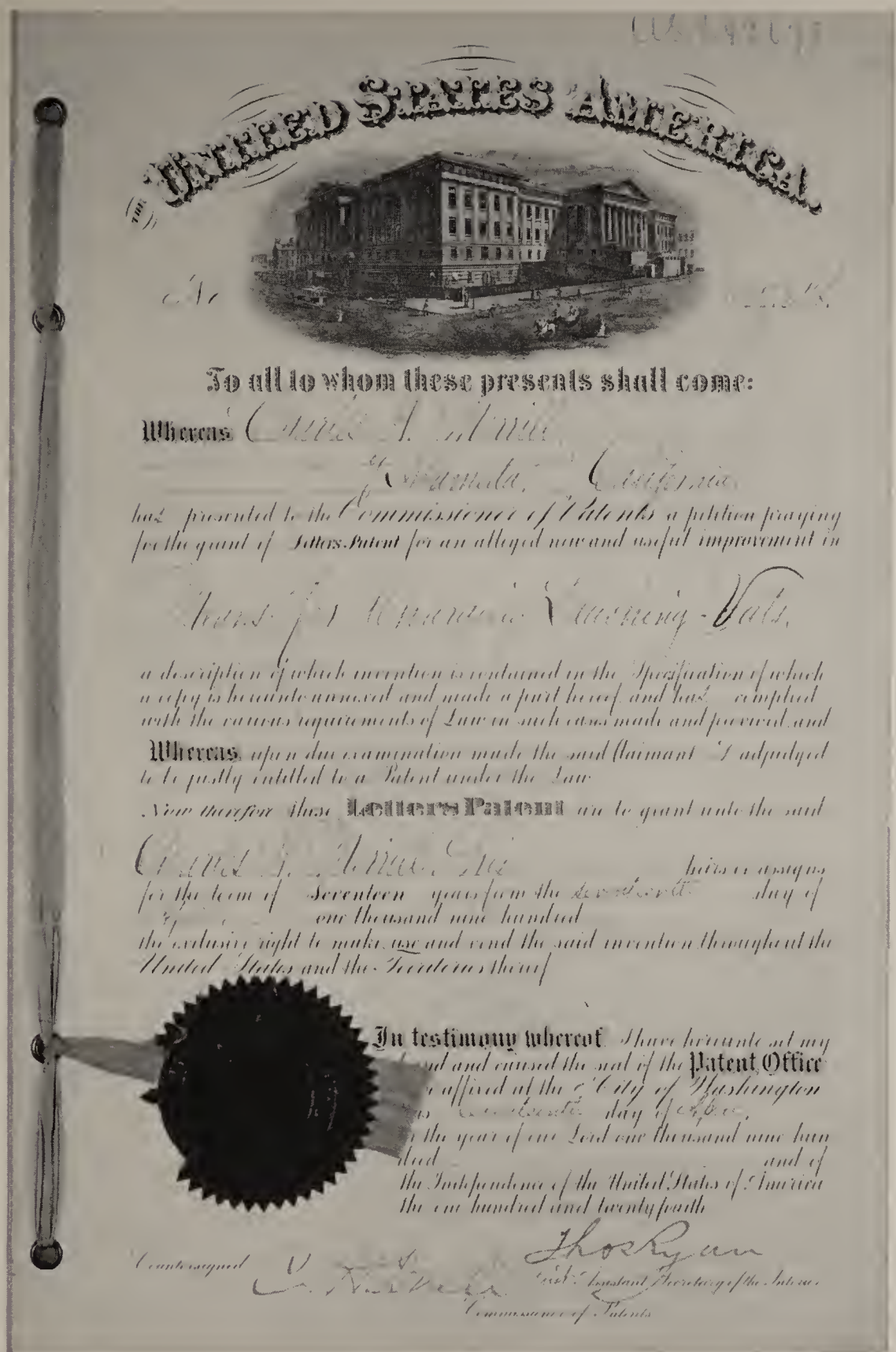
Queried concerning this a few months before his death, Merrill reflected a few moments, then said: "Well, now that you bring up the matter, I guess I will have to say—at the risk of appearing immodest—that, as far as I can recall, I never was in any doubt where I was going or the best way to get there." And so it seems, even without this confirmation, to his chronicler.

When, at the age of twenty-eight, Charles Merrill returned to San Francisco and married, he already had sufficient reputation as a successful metallurgical engineer to warrant the probability that he could have set up offices in San Francisco and earned a good living through his profession. And this undoubtedly would have been the easiest, most comfortable thing for him to have done. However, ease and comfort were no allures to one who had a destiny to fulfill, and Merrill appears never to have heard, much less listened for, their siren voices. Thus, very soon after his marriage, he left comfortable San Francisco behind as he set out with his bride for the Homestake Mine in the "Black Hills of South Dakota."

In the early part of the year 1899, Merrill arrived at The Homestake Mine in Lead, South Dakota; and because this mine was and is so world famous, it seems well to pause in our main narrative long enough to give some little account of the beginnings of what has been described as the "richest hundred miles square on earth."

Into this area there came in the late Winter or early Spring of 1876 two men—Moses Manuel and his brother Fred—soldiers of fortune and erstwhile gold-seekers. Years later, Moses Manuel himself told the story of their coming and of what they did and found there; and this is briefly what he told.

Moses and Fred had first been to Alaska; then to various regions of the Pacific Coast—always prospecting—finally drifting to Cheyenne, Wyoming, then to the Black Hills of South Dakota. There they continued prospecting, at first with no very satisfactory results, and then—but let Moses Manuel tell it in his own words.



UNITED STATES OF AMERICA.

To all to whom these presents shall come:

Whereas Charles J. Merrill

of Alameda, California

has presented to the Commissioner of Patents a petition praying for the grant of Letters Patent for an alleged new and useful improvement in

Means for Operating Steering-Gears

a description of which invention is contained in the Specification of which a copy is hereunto annexed and made a part hereof and has complied with the various requirements of Law in such cases made and provided and

Whereas, upon due examination made the said Claimant is adjudged to be justly entitled to a Patent under the Law

Now therefore these Letters Patent are to grant unto the said

Charles J. Merrill, his heirs or assigns for the term of Seventeen years from the seventeenth day of one thousand nine hundred

the exclusive right to make use and vend the said invention throughout the United States and the Territories thereof

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington this seventeenth day of April in the year of our Lord one thousand nine hundred and of the Independence of the United States of America the one hundred and twenty fourth

Countersigned C. Nesbett

Assistant Secretary of the Interior
Commissioner of Patents

Facsimile of one of first patents issued to Charles W. Merrill—
U. S. Patent 647678, April 17, 1900.

"We broke up camp again, and Fred and I left and struck out for what is called Box Elder, camped there, prospected that creek and got fine colors. Had been there a few days when some men came along and reported rich diggings a little farther north. We got in with two other men, one by the name of Hank Harney. Excitement was running high and everybody was reporting rich diggings and new strikes. We wanted to locate some quartz claims, and got placer claims and the Gold Run, for which we traded the De Smetz lode claim. Toward Spring four of us found some rich quartz. We looked for the lode, but the snow was still deep and we couldn't find it. When the snow began to melt I wanted to hunt it, but my partners wouldn't do it—didn't think it was worth anything. I kept looking every day for nearly a week, and finally the snow melted on the hill and the water ran down which crossed the lead, and I saw some quartz in the bottom and the water running over it. I took a pick and tried to get some out and I found it very solid, but I got some out and took it back to camp and pounded it up and panned it, and found it very rich. Next day Hank Harney consented to come, and he and Fred and I located what we called the Homestake Mine, the 9th of April, 1876."

That is Moses Manuel's terse account of locating the famed Homestake Mine. In the final paragraph of his little story he goes on to relate that he and his partners took out about $5,000 in gold the first year, and then, in 1877, sold out to Senator George Hearst and associates of San Francisco, for $70,000.

This, then, was the locale to which, some twenty-two years later in point of time (and many millions later in point of mine yield), Charles W. Merrill repaired—seeking, in the metallurgical problems of Homestake Mine, new worlds to conquer.

Chapter 10

"THE GOLDEN GULCH OF THE BLACK HILLS"

During the two decades elapsing between Moses Manuel's sale of the Homestake and the arrival there of Charles W. Merrill, much more had happened to the mine than space permits of being recounted here. The claim purchased from Manuel and his partners was comparatively small, so immediately upon acquiring it George Hearst and his San Francisco associates, J. B. Haggin and Lloyd Tevis, acted to acquire more claims and, this done, to install an adequate plant.

In so doing they displayed much imagination and courage, for the risks were great and the difficulties many and formidable. Not only was there no certainty concerning how extensive the gold-bearing ores might be, but every bit of the machinery—much of it very heavy—had to be transported by ox carts from the nearest railroad point, Sidney, Nebraska, 270 miles away. Moreover, a plant had to be erected and operated in a region which, only a few years earlier, had been the rendezvous of Indian tribes still actively hostile to the white men, and no one could say that they would not go on the warpath again.

Samuel McMaster, the man Senator Hearst hired as Superintendent, was likewise a person of great courage, fortitude and determination, and he gathered around him associates equally so. The result—almost incredible under the circumstances—was that within eight months after the incorporation of the company, all the equipment for an 80-stamp mill, as well as the auxiliary machinery for power, had been brought to the site, installed and was in operation. By December, 1878, less than a year later,

200 stamps were operating, and by March, 1880, there had been milled some 194,000 tons of ore, from which approximately 65,000 ounces of gold had been recovered—worth $1,300,000 in 1878 dollars! Quite an example of American free enterprise at work!

In the 75th Annual Report of the Homestake Mining Company there appears a short résumé of the mine's history, and from this we learn that "At the start, ore of fairly high grade was treated, but the concept soon grew that gold occurred throughout a broad lode, or belt, and that best profits could be made by mining in bulk, and milling relatively large tonnages of relatively lower grade material. Capacity of the plant was consequently steadily increased and, before many years, Homestake was widely recognized as an outstanding successful low-grade gold mine."

Here we have, in capsule, the Homestake Mining Company's own account of what essentially happened during the years following purchase of the mine in 1877.

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For over twenty of these years Homestake employed only the well-known "amalgamation" process—the gold was recovered from the crushed and finely ground ore entirely by using quicksilver to collect the small particles of gold in the pulp of ore and water. However, only about 75 per cent of the gold was thus recovered, and so "near the turn of the century Homestake became a pioneer on this continent in the application of the cyanide process, whereby an additional fraction of the gold remaining after amalgamation was recovered. To Charles Merrill and to A. J. Clark and W. J. Sharwood, who were on his staff and who remained with the company for the rest of their professional careers, goes the credit for this notable advance in gold metallurgy. So soundly did they work out the basic principles of the process that the plants today (1953) are successfully operating and holding their own against competing systems that have from time to time been exhaustively studied."

Thus did the annual report of the Homestake Mining Company, in the year 1953, pay its tribute to the genius of Charles W. Merrill for the successful application of his especially developed Cyanide Process to their mining operations more than half a century before.

This tribute does not, of course, pretend to tell the full story of

Merrill's hard work and accomplishments; that remains for us to do here.

When Charles Merrill arrived at the Homestake Mine in the early part of the year 1899, he had three successful applications of his Cyanide Process behind him—it had worked effectively at Bodie, at Harqua Hala, and at Marysville, Montana. But as he emphasized to his chronicler again and again, every mine is a law unto itself; each one is different in some respects from all others, and he encountered at Lead, in the Black Hills, problems which he had not been confronted with elsewhere. Nonetheless, his examinations and testings of the ores convinced him that the process could be successfully applied there, and he proposed a pilot plant to demonstrate it.

In General Manager Thomas J. Grier he found a willing listener and, throughout a long life, never ceased paying tribute to this man for his courage in ordering the plant constructed. Of course Grier knew of the young metallurgist's successful work at the mines herein previously mentioned; but each had its separate and unique problems, and Grier—a Scotsman—needed courage and vision to gamble money in "experimenting."

When the experimental plant had indicated the effectiveness of the Merrill Cyanide Process as applied to the Homestake ores, Grier ordered full-size commercial plants erected, and entered into a ten-year contract with Merrill to direct the building and operation of them. As compensation, it was agreed that he should receive a certain percentage of the gold recovered by his process, that otherwise would have been lost. This contract commenced in 1899 and terminated in 1908.

This was by all odds the largest and most difficult job the young metallurgical engineer had ever tackled; and, besides his own accounts, we have the testimony of various Homestake "old-timers" that during the first few years at Homestake he worked fourteen, sixteen and eighteen hours a day, seven days a week. Although Lead was not by any means a metropolis, it was a thriving bustling town, with quite an active social life; but again it is the testimony of the "old-timers" that whereas everyone soon knew Mrs. Merrill, her husband was known to but few besides mine officials and workers, and rarely seen except at the mine. "Cyanide Charlie," the workers called him behind his back, because, as one of them

Charles W. Merrill (left) with Thomas J. Grier, General Superintendent of Homestake Mining Company, at Lead, South Dakota, around 1900. Mr. Grier's son in center.

put it: "That man talked, ate, drank, lived and dreamed about nothing but his Cyanide Process." And amongst the diminishing few "Homestakers" of those days still surviving, it is still as "Cyanide Charlie" that he is spoken of.

In his eighty-seventh year, Merrill, reminded of this, chuckled and said: "Yes, at the time, I was so obsessed with the desire to conquer all the problems and make my application of the Process a success, that I didn't mind the long hours of hard work or the lack of leisure. But in later life I have thought many times of all the good bridge games I missed by being at the plant virtually night and day during those first two or three critical years." A moment later he added: "However, it was those hard years that laid the foundation for a long and successful career in my chosen field, so I shouldn't and don't complain."

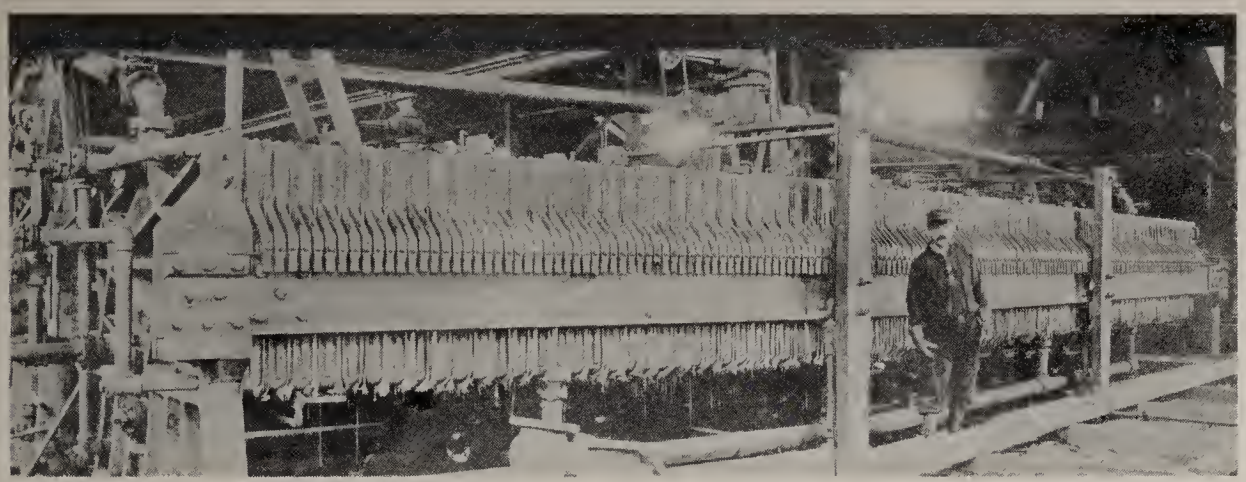
Chapter 11

"THE GOLDEN GULCH"—II

How the name Homestake came to be applied to the lode discovered by the Manuel brothers and their partner has never been conclusively established. There are a number of stories concerning this, but the one that seems to have gained the most general acceptance is that it was chosen by Moses Manuel as the result of a chance remark made to him by one W. P. Raddick, another Black Hills prospector who later ran the first livery stable in Lead and, still later, operated a garage there. As the story goes, Moses and Fred Manuel visited Raddick's campfire one evening and, during the course of conversation, Raddick remarked that the country "looked good enough for us all to make a homestake in." Moses, apparently an unlettered man, asked Raddick what the word "homestake" meant and, when told, turned to his brother and said: "Fred, that's a pretty good name for our mine."

As for the town of Lead (pronounced "Leed"), it took its name from the fact that the first little settlement in the nature of a town was adjoining the principal "lead" or "lode" of gold-bearing ore that had been discovered. This particular area was referred to as "The Lead," and when the town sprang up around it, the article "The" was dropped and it was called "Lead."

At the time the town was born, the only way of getting in and out of Lead was over a trail, either afoot or on horseback, and everything that came in had to be brought by pack animals. However, a few months after the settlement had been started, a wagon road of sorts was built by way of Poorman Gulch to the slightly older town of Deadwood, about four



Merrill Slime Filter—in Homestake Mining Company Plant at Lead, South Dakota, around 1900.

Original Slime Plant of Homestake Mining Company at Deadwood, South Dakota, housing large installation of Merrill Slime Filters.

miles distant. A year or so later another and much better road to Deadwood—a toll road—was laid out and constructed.

Deadwood, another mining town that sprang up overnight, has been variously called "the most vividly Western town that ever sprang up along a placer stream," "the wild West at its wildest," and "America's last frontier." Started by prospectors and miners, and the inevitable motley throng that always follows in the wake of prospectors and miners who prove successful, it antedates Lead slightly, and certainly outranked it in notoriety for many years. Indeed, it is hardly too much to say that its name went round the world because of the famous, infamous or notorious—call them what you will—characters it harbored. "Wild Bill" Hickock, noted gunman of the West who met his end here; "Calamity Jane," the "lady wildcat," whose name became a byword throughout the land; "Preacher" Smith, killed by the Indians in 1876; Jack McCall, the assassin of "Wild Bill," freed by a miners' court in Deadwood only to be hanged later by the Federal Government for his crimes; "Poker Alice," the cigar-smoking female card sharp of the early days; "Potato Creek Johnny" Perrett, picturesque prospector; "Deadwood Dick" Clark, the stagecoach driver whose fearlessness and proficiency with a rifle or shotgun saved many a shipment of gold, and whose career, variously improvised and exaggerated, provided the text for many a fast-selling "dime novel." These and dozens of other only slightly less bizarre characters made the town a synonym of the "Wild West," and gave to it color and romance which, if we are to believe contemporary visitors, still lingers today after three quarters of a century.

As Deadwood's twin, Lead never quite rose to the raucous splendor that bequeathed its sister (or brother) town its wide fame. But, although overshadowed by Deadwood, Lead itself was hardly to be classed as sedate and circumspect in its lusty youth.

Of course both towns had settled down very considerably by the time Charles Merrill made his appearance at the Homestake Mine. However, it was his testimony that even in 1899 many of Lead's foremost citizens "would as soon have appeared on the streets without their pants as their six-shooters," and that although normal law and order was in vogue and

generally respected, "miner's law" still had its stout and very vocal champions, as being much more certain and quick-acting.

It was Merrill's belief that the Homestake Mine had operated as the chief civilizing influence on both Lead and Deadwood; and it was of course indisputable that the mine's steadily expanding operations and increasing payroll provided the principal economic foundation on which both towns grew and thrived. As Homestake, under the impetus of the initiative of its owners and the capacity of its managers developed into one of the great gold-producers of the world, the two towns surrounding it—Lead and Deadwood—grew and prospered, and, in so doing, created a climate in which civilized living largely supplanted the old raucous, devil-may-care life of the frontier. There was plenty of the original atmosphere when Charles Merrill came to Lead in 1899, but it existed as the "frosting" on the cake and not as the cake itself, and found its life mostly in conversation instead of deeds.

Still, it was quite a different sort of place than San Francisco or Alameda or Berkeley, where Merrill had spent the most of his life up to then; and, had his work not engrossed him so completely, it may be that he would have found living there regrettably deficient in much of that to which he was accustomed. Under the circumstances, life in Lead probably was somewhat more difficult for his wife to adjust to; but, fortunately, she made friends easily and soon was taking part in the social life of the community.

Speaking of the Merrills some fifty years after they arrived in Lead, one of the community's pioneer women—Mrs. Charlotte C. Clark, has written: "I never got to know Mr. Merrill very well because he was always at the mine, it seemed. But Mrs. Merrill was a very friendly, social person, and I saw her often, knew her well, and liked her very much."

Without going into further detail, the foregoing will, it is believed, provide the reader with a fairly good idea of the region and the community where Charles W. Merrill pioneered metallurgical processes, methods and developments which won for him international renown, and operated over the years to the very great and lasting benefit of the gold and silver mining industry throughout the whole civilized world.

Chapter 12

"THE GOLDEN GULCH"—III

It was Charles Merrill's best recollection that he first encountered what eventuated in his Homestake assignment in the Fall of 1898, in San Francisco. This encounter was in the form of a discussion—a very lengthy one covering several days off and on—with B. B. Thayer, who, at the time, was Consulting Engineer for the Homestake Mining Company, and later became President of Anaconda Copper Company.

As Merrill recalled it after fifty-six years, Thayer called on him in San Francisco, told him he was familiar with his accomplishments at the mines where he had applied his development of the Cyanide Process, and at the termination of their two or three days of conversation, said he was recommending that Homestake engage Merrill to investigate the marketing of their very low grade pyrite concentrates. At the time, these were being sold to a smelter in nearby Deadwood, but it was Homestake's desire, Thayer said, to see if they could be treated at the mine at a profit greater than was being received from the smelter.

True to his promise, Thayer recommended that Merrill be engaged by Homestake to investigate this matter; and it was under these circumstances and for this purpose that Merrill made his first visit to Lead. As he succinctly phrased it:

> "Therefore, I proceeded to the mine, and quickly determined that they were doing better with the smelter than could be done by home treatment."

And there the whole matter might have terminated had Merrill been just an ordinary metallurgist—having made the investigation he was engaged to make and reported his findings, that would have ended it all. However, such was not the way this man's mind worked. While at Homestake conducting this specific investigation, his keen eye saw something else which interested him very much. Again reverting to his own terse account of what occurred—

> "However, while there, I was impressed with the tremendous total values in the immense tonnage of their very low grade tailings which were being run to waste, and took samples thereof back with me to San Francisco and began work on them, hoping to recover some of these waste values by treatment with the Cyanide Process."

After working for some time on these samples in his San Francisco laboratory, Merrill concluded that the tailings could be cyanided at a profit. Accordingly, he then returned to Lead and, in a conference with Homestake Superintendent Grier and Edward H. Clark, Manager of the Hearst Estate, proposed the erection of a pilot plant as the next step in the solution of the problem.

Grier and Clark agreed to his proposal, the pilot plant was erected and demonstrated that what Merrill's tests had led him to believe possible, could be accomplished. Quoting again from his own account—

> "Consequently, the company determined to erect a large plant to treat the sand portion of the tailings from the mill located at Lead, which proved successful and materially increased the total recovery and profits from the treatment of the ore."

This was the plant which became known as "Cyanide No. 1."

In his account, Merrill explained that the Homestake ore body extended north, and that the ore from this northern extension of the mine was being treated in another valley. So, after completion of Cyanide

Recent view of Homestake Mining Company's plant at Lead, South Dakota. Here, around the turn of the century, the young metallurgist, "Cyanide Charlie" Merrill, gained world renown for the application of his cyanide process.

No. 1, a second plant was installed in that valley. These two valleys—in one of which Lead was situated—merged just above the town of Deadwood, some four miles from Lead. "Therefore," stated Merrill, "we conducted experiments looking toward profitable treatment of the slimes—a muddy portion of the tailings—which were being separated from the sands because they were too expensive to treat. The experiment on this slime gave hopeful indications, so we determined that the two flows of slime pulps—one from the Lead mills and the other from the mills in the second valley—should be brought together on a hill above the confluence in Deadwood."

Since what Merrill decided should be done, as well as how it actually was done, are very technical matters, it seems best to continue to quote verbatim from the written statement he made to his chronicler. In this report he wrote:

> "In the treatment of all the tailings a problem was the presence of reducing material in the tailings, which, unless oxidized, prevented the dissolution of the gold by Cyanide Solution. To accomplish this oxidation, it was necessary to aerate both the sands and slimes. This was not too difficult to accomplish with the sands, but owing to the very fine communation of the slimes (i.e., their muddy nature), they presented a real problem.
>
> "The first step in my proposed process for treatment of the slimes was to dewater them, and this was accomplished by filtration in very large filter presses, and then aerating the filter press cakes by air pressure. After aeration the cake was leached with cyanide solution thus dissolving the gold, and then precipitated by my zinc dust process. The key to the successful process was my invention whereby the treated filter cake could be removed by sluicing the filter press. This method supplanted the costly hand removal of the treated cake as practiced in Australia, the cost of which would have been completely prohibitive at Homestake. Furthermore, my method permitted of the construction of 26-ton presses, whereas the largest press previously built had a

capacity of only four tons—a most important economic advantage. In view of this, I conferred with Grier and told him I wanted to build a small experimental filter press with a mechanism for *sluicing out* the slime cakes after treatment. He agreed, and after successful experiments with this small sluicing press, I told him I would like to build a larger press as the next step. When I suggested a press having a capacity of ten tons, he immediately asked if I couldn't build a larger press. To this I replied, 'Yes, I certainly can and would like to, but it is going to cost $10,000 just for the ten-ton press.' I mention this remark of Grier's because it demonstrated the breadth of his vision and his whole attitude—proposing a larger press instead of the $10,000 press, just for an experiment! The ten-ton press proved successful and consequently a very large plant was erected, containing a large number of filter presses, each having a capacity of 26 tons per charge. This plant was located above the confluence of the valleys mentioned above.

"Both the sand and slime plants broke the world records for the low cost of the treatment of sands and slimes, and, after over fifty years, the advances in other metallurgical details have not altered the methods we used at Homestake, or operated more cheaply."

Here, in something less than 300 words, is Charles W. Merrill's own terse and modest account of something which revolutionized metallurgical procedure with respect to recovery of gold and silver from mine wastes, and added untold millions of dollars to the value of mines all over the world, to say nothing of winning for him international acclaim and many specific honors.

Commenting, fifty years later, on Charles W. Merrill's achievements at the Homestake, Mr. G. O. Wilson, of Dorr-Oliver, Incorporated, in a letter to John L. Merrill, dated July 31, 1956, says:

"Circumstances have prevented our meeting, but I shall look forward to it soon. I knew your father to some extent, and of course I

am fully aware of the wonderful work he did at Homestake many years ago. As a matter of fact, I spent several years up there, trying my best to throw out the Merrill presses in the Deadwood plant, but never was able to overcome the fact that a continuous process consumed about ten cents per ton more cyanide than does the Merrill sand slime process which started and has been maintained since about 1906."

Chapter 13

"THE GOLDEN GULCH"—IV

It seems hardly necessary to state that Charles Merrill's brief account, with which we concluded the last chapter, does not by any means tell the complete story of his difficult work and extraordinarily brilliant and fruitful accomplishments at the Homestake Mine. Accordingly, it is our purpose now to round out the story, at least in some particulars.

It is equally unnecessary to say that the task which Merrill addressed himself to at Homestake Mine was not one which he could carry out successfully alone. It was of vast scope and great complexity; accordingly, shortly after undertaking it, he began assembling a staff of technical assistants, each of them trained for some specific part of the over-all task.

The first of these in point of time was Dr. W. J. Sharwood, characterized by Merrill as "an exceptionally endowed chemist." He had been with Merrill as his assistant at the Drumlummon Mine in Marysville, Montana, and now came to act in a similar capacity at Homestake. Dr. Sharwood rendered invaluable aid to him during the years Merrill was at Homestake and, on the latter's departure in 1908, went on the staff of Homestake Mining Company where he remained until the end of his professional career.

Merrill's other principal assistants at Homestake were Charles C. Broadwater, Louis D. Mills and Frank H. Ricker.

Broadwater was a graduate of the Royal School of Mines, Mills a graduate of Stanford University in Mining and Metallurgy, and Ricker

had the degree of Mechanical Engineer from Iowa State College.

All three were young men recently out of college, and all had been highly recommended to Merrill as being especially capable in their respective fields, as well as loyal and energetic and not at all averse to hard work. His testimony concerning them, given from the vantage point of fifty years after, was that in practice they all had more than measured up to their advance notices. They were all, he said, as loyal and devoted as they were gifted, and, after a short period of "apprenticeship," had proved themselves capable of carrying out any assignment with which they were entrusted.

While on Merrill's staff at Homestake, Mills and Ricker functioned entirely within the fields for which they were trained, but Broadwater acted also as a sort of administrative assistant and general helper.

In addition to these men on his own staff, Merrill had the enthusiastic assistance and loyal cooperation of the whole technical staff of the Homestake Mining Company. As he put it: "We all worked together as an harmonious team, and I am frank to say that accomplishments could never have been what they were without the help of the Homestake staff of experts, as well as my own."

It was characteristic of Charles Merrill to minimize the importance of his achievements, just as it was his disposition to understate the difficulties and problems he had to overcome and solve. Thus, in after years he was inclined to speak of his Homestake assignment as if it had been rather more easy than hard, more fun than work; and it may even be that it so seemed to him after it was so far behind him. However, the evidence of those who, as his assistants or otherwise, had a part in it is quite to the contrary.

Actually, the original McArthur-Forrest Cyanide Process—for which patents had been issued in England in 1887-88 and which had been first applied in New Zealand in 1889—had been tried at Homestake in 1892 but had proved ineffective.

Also, the reason why Merrill, during his first several years at Homestake, worked incessantly—to the extent that, as has been previously remarked, hardly anyone knew him except the Mine officials and workers

—was because the difficulties were so great and the problems so numerous and complex. Although he never was in any doubt that his processes could be made effective at Homestake, as they finally were, there were times during the first two or three years when his ingenuity was taxed to the utmost to solve collateral problems which, although not assailing the principles involved, decreased the effectiveness of their application in practice. He was sure he "had something"—something big, but there were equally big obstacles he must overcome.

One of his Homestake staff, Frank Ricker, is still living as this is written; and in talking with the writer concerning his early years with Merrill at Homestake, he remarked:

> "I was on the night shift a long while, and I well recall how frequently Charlie Merrill would leave the plant late—maybe ten or eleven at night, only to come back at two or three in the morning to make sure that everything was going alright. I never did understand how he could keep going with so little sleep and rest, but he did, and showed no signs of strain—he was always kindly and gracious, even in correcting us."

Ricker went on to say: "All of us worked a twelve-hour day at that time, but Charlie worked fourteen or sixteen or more."

Ricker recalled particularly that whenever the big Merrill filter presses were opened at Homestake, Merrill was always present, even though it invariably occurred around four o'clock in the morning.

As a Mechanical Engineer, Ricker helped build these filter presses, which had been invented and designed (and by this time patented) by Merrill, and stated that because of their large capacity and their "sluicing pipe," they were a "revolutionary improvement over anything that had been used for such a purpose before."

Ricker also emphasized that Merrill did not work these long hours just for the sake of working, but that there was, so to say, "method in his madness." "He was," said Ricker, "constantly observing, constantly testing, constantly experimenting—both to overcome or modify existing diffi-

culties to improve his equipment, processes and methods. For instance," he went on, "as a result of Charlie's experiences with Cyanide No. 1, when he built Cyanide No. 2 he was able to effect improvements which cut the operating costs from about 21 cents a ton to about 17 cents a ton, and when you are dealing with large tonnages, that amount of saving is quite an item."

Incidentally, Ricker remembered that for a time Louis D. Mills was foreman of Cyanide No. 1, while Henry Hanson was foreman of Cyanide No. 2, and pointed out that part of the reason for Mills' later success in installing the Merrill processes in mines in all parts of the world, was because he had served this kind of an "apprenticeship" under Merrill at Homestake.

It was one of Ricker's jobs to build the "sluicing pipes" Merrill had designed for use in his slime filter presses, and he recalled that while he was doing so the predictions from the "sidewalk engineers"—the workmen who came and went—were loud and almost universal that "the damned thing couldn't and wouldn't work." "Consequently," said he, "there were a lot of red faces around when we finally got the first one installed and it not only worked, but worked perfectly." Besides all the scoffers there was, he said, one man who had believed it would succeed; and, when it did, this fellow turned to the doubters and said: "I told you old Cyanide Charlie'd come through again, and now by - - - he has!"

* * *

A complete, detailed and technical account of all that Charles W. Merrill achieved at the Homestake Mine, and how he achieved it—all that would require a book just by itself. Consequently, since this book does not aspire to be a technical treatise, and, moreover, has much additional ground to cover, it seems well to conclude this chapter by quoting from an appraisal of Charles Merrill's achievements at Homestake, made some three decades later by Thomas M. Newell in an article appearing in *The Western Mining News*. In this article, Newell said, in part:

> "In 1899 he went to Lead, South Dakota, as Consulting Metallurgist for the famous Homestake Mining Company. Here,

Merrill carried out a programme of research and invention which established him as one of the world's foremost metallurgical engineers. The contributions to metallurgy made by Merrill during his stay at Lead received recognition when he was awarded the Douglas Gold Medal by the American Institute of Mining and Metallurgical Engineers for 'distinguished international achievements in metallurgy.'

"The keystone of Merrill's inventions is the Merrill Precipitation Process, which utilizes zinc dust, rather than zinc shavings, as a means of precipitating gold and silver from cyanide solutions. While at the Homestake, Merrill developed, in addition to the precipitation process, the Merrill Clarifying Filter and the Merrill Slime Press. This latter invention involves a filter press which can be operated continuously. Prior to the introduction of Merrill's press, it was necessary to take the presses apart at the end of each operation, an extremely expensive procedure. The increased efficiency of these inventions over previous means of precipitation has, in effect, increased the value of the world's gold and silver supply by a vast amount. It has been estimated that at the Homestake alone, the value of effective reserve in the ore was at that time raised by approximately $20,000,000.00 as a result of Merrill's work."

Small wonder that from Homestake, from the "Golden Gulch" of the Black Hills of South Dakota, the name and fame of Charles Washington Merrill quickly travelled 'round the world.

Chapter 14

THE NATIVE'S RETURN

THE TEN YEARS Charles Merrill spent at Homestake—in the "Golden Gulch" of the Black Hills of South Dakota—were probably the most important years of his life, unquestionably so from the standpoint of his professional career. He went there a fledgling of twenty-nine, a successful fledgling, to be sure, but a fledging nonetheless, whose metallurgical wings were still far from fully developed. He left there a decade later a seasoned veteran, with a full measure of achievement behind him, achievement that provided the broad, solid foundations on which the remainder of his long and eminently successful career in mining, metallurgy, invention and business was based.

"The proof of the pudding is in the eating"—Merrill's contract with the Homestake Mining Company stipulated that he should receive no salary for his work there, not even expenses, but provided that if he succeeded in doing what he proclaimed he could do, he would receive as compensation a certain percentage of the value of the additional gold recovered by applying his processes, methods and equipment to the mine's wastes. That he more than fulfilled his promise is attested by the fact that the compensation paid him by Homestake, under the contract, amounted to a small fortune—at a time, incidentally, when men still were permitted to keep what they honestly earned.

In the year 1908, with his work at Homestake finished and the contract terminated, Merrill sold his home in Lead and left for San Francisco. He took with him, as already has been said, a fortune. But there was some-

thing else more prized and precious than that. He took with him his wife and the three children that had been born to them during their Homestake years—a daughter, Beatrice Maude, born March 8, 1900; a son, John Lisgar, born March 29, 1903, and a second son, Gregor Charles, born December 2, 1906. (A third son, Bruce Robinson, was born May 22, 1911.)

Having built a large, comfortable house near the Campus of the University of California in Berkeley, Merrill installed his family there, and, as he observed to a friend later, "took some time off to get settled, but mainly to get really acquainted with my family."

Actually, that was no idle statement. What has been said before, bears repeating—during the Homestake years Charles Merrill had worked, literally without surcease, day in and day out, month upon month, year after year. It is the statement of Frank Ricker, then his assistant and later his associate, that "in four years I only knew Charlie Merrill to take off three full days. And that was because he was in bed and so sick his wife wouldn't let him get up and go out in a raging blizzard! That was the only time I ever remember Charlie to have been off the job, at Homestake."

It may be difficult for many young men of today to realize how anyone would be so devoted to a task and could work at it so unceasingly. To them there should perhaps be offered the reminder that, although the harsh regimen to which the youthful Merrill subjected himself at Homestake may not have been the rule even then, neither was it by any means the exception. Though only fifty years or so away, that was an age different from ours. This is no place for a moral, economic or political homily, nor yet for a nostalgic dissertation on "the good old days." Yet it may be permissable to suggest that half a century ago the annals of America were filled with examples of young men, who, with no more implements than ambition, intelligence, perseverance and a willingness to work, struck out for themselves and made their fortunes. Indeed, that was, in large measure, how America was developed, and the reason for its rise to giant economic stature.

Thus it was that Charles Merrill did not look upon what he had done

during his ten years at Homestake as being anything unusual or extraordinary. It was, in fact, merely the equivalent of what he had seen or read of many another young man doing, what he had planned and expected to do, himself. To be sure, he had worked hard and incessantly, and made many sacrifices; but—he had gained his reward, attained his immediate goal.

That is, perhaps, what is hardest for the youth of today to comprehend—the willingness to wait, to endure, to sacrifice, in order to gain a reward. Too many of us of today want what we want, and want it—easily—*now*, without waiting, without enduring, without sacrifice or discomfort.

Discussing this with his chronicler, Charles Merrill, a few months before his death, remarked: "Yes, with conditions being what they are today—capable young men being signed up for good-paying jobs with big corporations before they have even finished college—I suppose it is a bit difficult for young people to understand what most of us accepted as normal fifty years ago. Someone has defined a 'pioneer' as a man who fought Indians with one hand, while he hewed logs to build a cabin in the wilderness with the other; and while in my young days we could not claim to be 'pioneers' we were enough closer to them in point of time to permit of our having, and perhaps benefitting by, some of their attitude. Actually," he continued, "the wives of the 'pioneers' had it harder than their men folk. For, as someone wittily said: 'the pioneers had to put up with plenty of hardship, but the pioneer's wives had to put up not only with the hardship but with the pioneers.' Though I can't of course lay claim to being that kind of a 'pioneer,' that was somewhat true of my experience in Homestake. During the first few years, my wife had to put up with a man whose work kept him away from home so much that he was almost a stranger there. But fortunately that period did not last too long, and when my Homestake work was finished and we settled down in Berkeley, the 'pioneer days' were definitely over."

Life in which his family was the focal point, the living center, that was the life Charles Merrill had desired and dreamed of during all the long hard years at Homestake. And now that these years had rewarded him with a competence, he could effectuate this deep desire. That was, he

emphasized, the reason he chose Berkeley for their home. He felt that a college town—and Berkeley *was* a town, not a city, in those days—would provide the quiet stability, the serenity and the "hominess," as well as the spiritual and cultural atmosphere, necessary to permit the fullest and best life for his family.

And so it was that, in the year 1908, with his home in Berkeley and with his newly established offices in San Francisco, Charles Washington Merrill began writing another chapter in the book of his life.

Chapter 15

EXPANSION AND ORGANIZATION

HAVING DEMONSTRATED the effectiveness of his various metallurgical processes, methods and equipment, and having been granted patents covering all of these, Charles W. Merrill determined to make them available wherever they were applicable to gold and silver mines throughout the world. To this end, when he concluded his work at Homestake in 1908, he returned to San Francisco and there established his base of operations by opening offices and setting up a well-equipped laboratory.

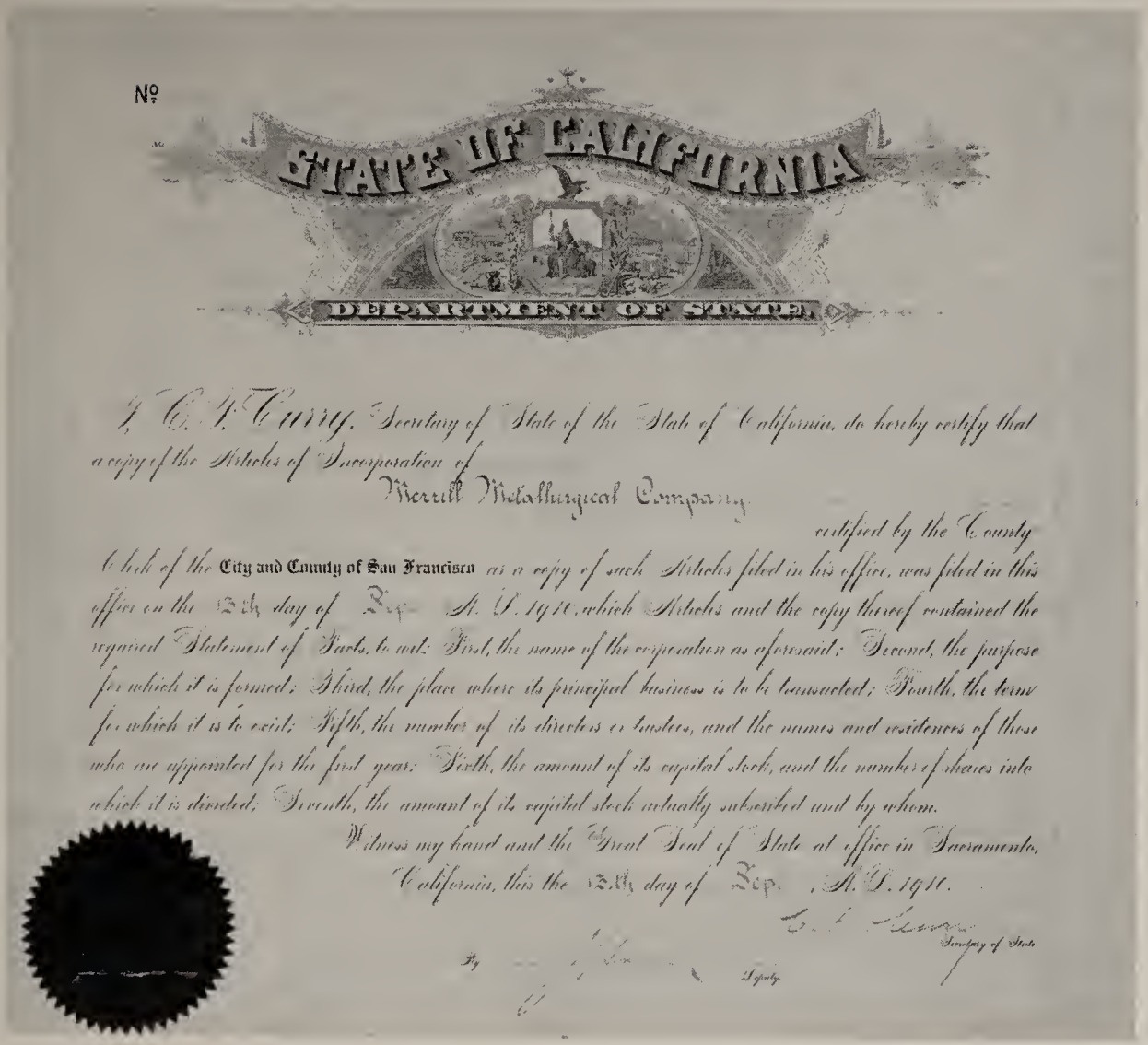
Experience soon convinced him that the pursuit of his objective could be carried on most expeditiously by collective effort, so before the end of the year he started The Merrill Company and invited three of his principal Homestake assistants—Charles C. Broadwater, Louis D. Mills and Frank H. Ricker—to join him as associates.

These men accepted his invitation and, for about two years the firm operated on a partnership basis. Then, in 1910, The Merrill Company was incorporated; with Merrill as President, and Messrs. Broadwater, Mills and Ricker as the other officers and directors. About a year later Herbert S. Shuey, a University of California graduate who had been introduced to Charles Merrill by the latter's father, joined the company.

In later years, when The Merrill Company had gained national and international renown, Charles Merrill was asked by the Editors of *Nation's Business* to outline for publication in their magazine the reasons for the success of the organization he headed. He did so in an article

captioned "The Structure of a Business Shapes Its Destiny," in which he said, in part:

> "The demand for the metallurgical processes for which patents had been granted me had grown until a business organization was needed to carry out a task which had become too great for a single individual. The selection of a staff of men who would work effectively together became imperative.
>
> "These men had to have initiative and ability, yet each must subordinate his purely individual preferences to a common purpose. It was apparent that I must get together a staff of men who would stand by me to the last ditch in carrying out my own ideals and purposes and—of the utmost importance—that I must share the profits with them.
>
> "The problem reduced itself to much the same as that which is involved in building or selecting the executive staff of any business. But the problem is not always as clear cut as it was in this instance, nor as important, because sharing profits, I hoped, meant life partnership.
>
> "I had worked with and had intimate acquaintance with many promising young mining engineers. This was the human material from which I could select the men who would measure up to my specifications.
>
> "When I set about the task of building a staff, I made this my chief test: 'Will this man do as he knows I would do when his own judgment might dictate otherwise?' I wanted men with judgment, but men who would subordinate their own judgment to mine. It has been my experience that a deep bond of personal loyalty must exist before a man of ability will defer his own judgment to that of another. Therefore, I emphasized personal loyalty as the most important quality to look for. Character and ability I considered of about equal importance. On a percentage basis, I rated loyalty 50 per cent, character 25 per cent, and ability 25 per cent.



№

STATE OF CALIFORNIA

DEPARTMENT OF STATE.

I, C. F. Curry, Secretary of State of the State of California, do hereby certify that a copy of the Articles of Incorporation of

Merrill Metallurgical Company

certified by the County Clerk of the City and County of San Francisco as a copy of such Articles filed in his office, was filed in this office on the 13th day of Sep. A. D. 1910, which Articles and the copy thereof contained the required Statement of Facts, to wit: First, the name of the corporation as aforesaid; Second, the purpose for which it is formed; Third, the place where its principal business is to be transacted; Fourth, the term for which it is to exist; Fifth, the number of its directors or trustees, and the names and residences of those who are appointed for the first year; Sixth, the amount of its capital stock, and the number of shares into which it is divided; Seventh, the amount of its capital stock actually subscribed and by whom.

Witness my hand and the Great Seal of State at office in Sacramento, California, this the 13th day of Sep. A. D. 1910.

C. F. Curry
Secretary of State

By [illegible] Deputy

Certificate of Incorporation of the Merrill Metallurgical Company, predecessor of The Merrill Company, September 13, 1910.

"One usually gets his first glimmer of a man's possibilities for executive work from talking to him. But, of course, action is more conclusive than talk. Staying power at hard work is a valuable touchstone, and all the young engineers who joined me had worked years in the metallurgical plants I had designed and operated. When one young fellow, just out of engineering college, applied to me for a job, I set him to work on the rockpile, helping the stone mason. At the time I thought that would be an easy way to get rid of him. But he had the necessary staying power, and today he is one of my most valued associates.

"In general, when I have thought that a man had executive ability, I have tested him in operation as one would test a new process or machine. I try him out in a small way. If he demonstrates satisfactorily as a 'trial plant,' I set him at larger tasks.

"During the war (World War I), Secretary Hoover called upon me to take charge of the Division of Collateral Commodities of the Food Administration. It meant leaving my own organization to function without my direction for nearly two years. This it did, and probably as effectively as though I had never left it at all. The reason, I believe, was the care and the fundamental engineering principles I had used in selecting my co-workers years before."

* * *

In this document of his own words, there is epitomized what might well be termed the "working philosophy" by which Charles W. Merrill was actuated and directed throughout his long and fruitful career. Or, if we choose to speak in terms of one of the graphic arts, it might be titled "self-portrait," so faithfully does it portray the mental and spiritual lineaments of the man whose life and achievements provide at once the inspiration and the material for this chronicle.

Chapter 16

UP, DOWN AND UP

THE MERRILL COMPANY began doing business in San Francisco in 1908, and was incorporated September 13, 1910. Its first corporate name was "Merrill Metallurgical Company," but so many people had difficulty with the name (wires and letters came addressed to "The Merrill Metal Surgical Company"), that the word "Metallurgical" was dropped from the corporate name. Its first offices and laboratory were at 143 Second Street, between Mission and Howard, and there they remained for about five years.

The wide and growing demand for Merrill's metallurgical processes and equipment had moved him to start the Company, to handle their installation and the financial transactions incident thereto; and during the greater portion of these five years this demand kept up. Consequently, business was good and the young company prospered and grew in staff.

However, that old adage about "the course of true love," sometimes applies equally to business, and this proved true with respect to The Merrill Company. It so happened that in the years 1912 and 1913 most of its business was concentrated in Mexico, and, when the Mexican Revolution broke out, the bottom promptly fell out of it.

With a man of wealth in the background, this might not have been alarming but for the fact that, from the very beginning, Charles Merrill had insisted that the Company must make its own way and stand on its own feet. Consequently, there was growing concern as finances dwindled and no new business came in to replace the Mexican losses; and Vice

President Herbert Shuey still vividly recalls that, as pay day approached during the week before Christmas, 1913, it became known that there was not enough money to meet the payroll. Bad enough at any time, this seemed worse because of the festive season approaching, and there was little but gloom around the office.

And then—what seemed to all concerned like a miracle happened. To quote Herbert Shuey: "It was the morning of December 24th—the day before Christmas; and while I don't think anyone was expecting to starve right away, certainly no one was exactly happy; in fact we were all pretty blue. Then, the office door suddenly opened and in walked a Western Union messenger boy. With him he had a telegram, and, on opening it, we found that it was from a large mining company in Nevada, placing an order with us for our Process and a very substantial amount of our equipment. After enumerating the various items wanted, the wire concluded with 'Merry Christmas!', and I am sure that to all in our organization those two words never generated a happier feeling. Now we knew we were in business again, and everyone left the office on Christmas Eve, cheerful and optimistic."

That, as Shuey remembers, was the closest the young company ever came to the shoals. The Christmas order from the Nevada mining concern proved a good omen. Immediately thereafter, business began picking up; and although there were to be times of stress and strain, with problems to solve and obstacles to overcome, never again did The Merrill Company have to worry about meeting a payroll.

Business continued to grow and, to keep pace with it, the Company moved into larger quarters in the Rapp Building, next door to its original location.

In 1915, only nine years after being visited by the most terrible disaster ever to befall a great city in modern times, San Francisco played host to the world through The Panama-Pacific International Exposition. Millions came to it from all parts of the globe, and none left without being inspired by this glowing and unforgettable demonstration of the unconquerable spirit of man.

The Merrill Company took an active part in the Exposition. It had

an interesting and attractive exhibit, and its officials entertained many visitors from many parts of the world. This was indeed concrete proof of the Company's rapid recovery from its "depression."

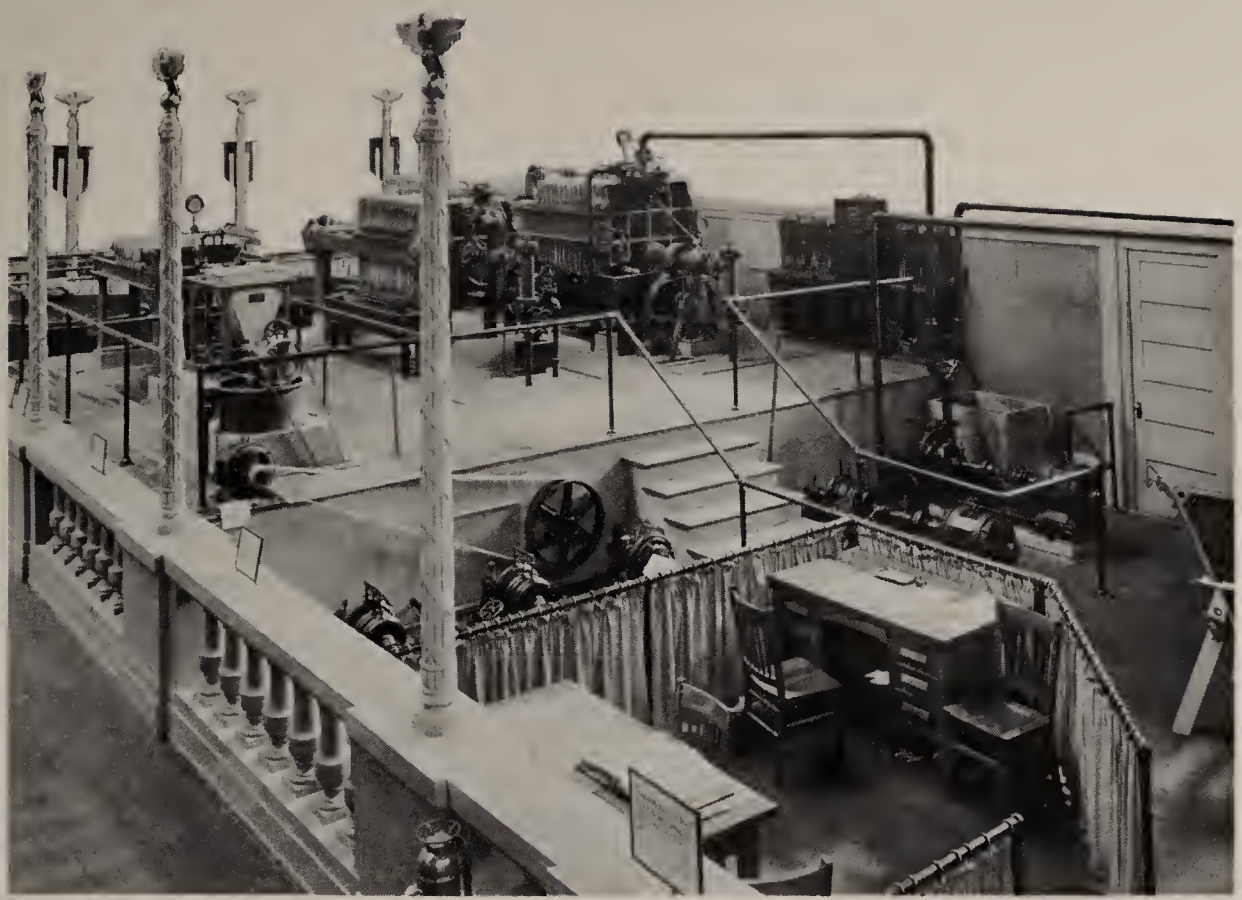
Further proof of this was that, in 1916, The Merrill Company organized what became one of its very important subsidiaries. This was The Alloys Company, and its purpose was to produce the zinc dust required in the Merrill Precipitation Process.

In this connection it will be recalled that a part of the pronounced success of Charles Merrill's Cyanide Process at the Homestake Mine was due to his discovery that zinc dust, which was used in his new precipitation process, was much more efficacious for the purpose of precipitating, than the zinc shavings previously used.

Thereafter, zinc dust came into general use wherever the Merrill Precipitation Process was installed, and very large quantities of it were required by mining companies throughout the world. Prior to World War I, the supply of it was ample. It was a by-product of smelting operations, and most of it came from the smelters of Belgium. However, shortly after the outbreak of the war, in 1914, Belgium was invaded and the Belgian smelters closed down. With the foreign supply of zinc dust thus shut off, it became necessary to develop a source in the U. S. A. It was to meet this situation that The Merrill Company acted.

In 1916, Minton H. Newell, a very capable chemist, joined The Merrill Company. He brought with him a new and novel process for manufacturing zinc dust. Shortly thereafter, The Alloys Company, of which he became a substantial stockholder, was formed to produce this much-needed product. A plant was built in San Francisco, and, through further research, a manufacturing technique was developed that enabled the Company to produce a wide variety of zinc dusts, each of which was so controlled as to yield uniformity of size and chemical characteristics.

The Alloys Company met with great success, both during and after the War. It sold its quality products in large and steadily increasing volume throughout the Americas, the Orient, Africa, and Europe, competing successfully even with zinc dusts made by low-cost Oriental and European manufacturers. Certain types of its products were used in the



Part of The Merrill Company's Exhibit at the Panama-Pacific International Exposition in San Francisco, California, 1915.

manufacture of hydrosulfites, dyes, paints, protective coatings, etc., and its trade-marked product, "Merrillite," became the standard in Cyanide Precipitation everywhere.

The Alloys Company also manufactured lead dusts by a method developed in its own laboratories, marketed a pipe-joint compound in which this lead dust was an important ingredient, and perfected methods of manufacturing litharge and red lead.

During its twenty-six years of active existence, The Alloys Company constructed and operated five zinc dust plants—to meet the increasing demand for its products. Four of these were on the Pacific Coast. The last of these, located in Emeryville, California, had a capacity of approximately 4,000,000 pounds a year. Early in 1941, a wholly owned subsidiary of The Alloys Company—B. C. Metals, Ltd.—established a plant in Vancouver, B. C., with an annual productive capacity of about 1,600,000 pounds. Despite wartime conditions and the scarcity of materials, this plant was completed and in production within thirty days from the time that ground was broken!

In 1945, after the termination of hostilities in World War II, The Merrill Company, desiring to concentrate its efforts in other fields, sold The Alloys Company to Metals Disintegrating Company, of Elizabeth, New Jersey.

Chapter 17

"SEND FOR THE BEST MAN IN THE COUNTRY . . ."

On April 6th, 1917, America entered the European war, commonly known today as World War I, on the side of England, France and Russia. On that same date, an American in London received word from Col. House that President Wilson wanted him to return to the United States to take charge of war food organization.

Replying that he would first need a short time to get Belgian Relief matters in shape, Herbert Hoover proceeded quickly to do what was necessary in this respect and, on May 5, 1917, arrived in Washington. On reporting to President Wilson the same day, he had confirmed what he had been told in London—the President asked him to organize the food of the U. S. A. for war. Hoover agreed, but stipulated that he should receive no salary, because . . . "I believed the position would carry more moral leadership if I were a volunteer alongside of my countrymen in war."

Four days after Herbert Hoover's arrival in Washington, the U. S. Food Administration was launched—May 9th, 1917.

Concerning some of the preliminary difficulties of getting this effort under way, Hoover writes in his Memoirs:

> "The second of our policies concerned the method of internal organization. One of the preliminary mental exercises of some of our Food Administration people, habitual in all Washington departments, was the making of organization charts with circles, squares and converging lines showing precisely where everything

belonged. Some felt that we could not know where we were going without such a chart. Finally, at one of our early meetings, I remarked that, if this kept on, we would spend every morning revising charts. I stated:

> 'This is an emergency organization and a new operation. Every day we must meet new problems. Therefore, my notion of organization is to size up the problem, send for the best man or woman in the country . . . give him a room, table, chair, pencil, paper and wastepaper basket—and the injunction to get other people to help, and then solve it. When that problem is out of the way, we shall find plenty more'."

"Send for the best man in the country . . ."—that was precisely what Food Administrator Hoover did. And the man he sent for to head the Division of Collateral Commodities* was Charles Washington Merrill of San Francisco. Being sent for, under these circumstances, he came—quickly.

Charles Merrill and Herbert Hoover had first met in San Francisco in their youth—when Merrill was working for one Janin brother and Hoover for the other. They were then in contact with each other for only a relatively short period, as both left San Francisco soon afterward. And although their professional contact was maintained, it was Merrill's best recollection that, except briefly when he was visiting England in 1911, he did not again see Hoover until 1917. Evidently, however, their period of direct contact, short though it was, was long enough for each to take the measure of the other. For when Hoover wanted someone to take charge of Collateral Commodities, he lost no time in asking Merrill to do the job. And Merrill, equally without hesitancy, consented.

Charles Merrill was never less than forthright and frank. Years later,

*The Division of Collateral Commodities had the responsibility of maintaining the supply, at proper prices, of all products and materials which were essential to the production, distribution, preservation, etc., of food, but which were not articles of food.

when reminiscing for the benefit of the writer concerning World War I services under Herbert Hoover, he said:

> "You know, when Hoover asked me to take on that job, my first reaction was genuine annoyance and then indignation. I was annoyed because I didn't want the interference with my professional and business career, which was then extremely active. And I was indignant because I knew my respect and admiration for Hoover was so great I couldn't possibly refuse his request. Of course," he continued, "that feeling only lasted a short time. And now, as I look back on it, it is one of the two things I have done in a rather long life that brought me the greatest real satisfaction."

To give the complete list of all the other "best men or women in the country" that were sent for by Hoover to help him carry out the Food Administration programme would be out of place here. Suffice it to mention that several, besides Charles Merrill, were San Franciscans, and that one of these was none other than Merrill's old classmate at the University of California—Charles H. Bentley, of California Packing Corporation and "Del Monte" fame. Others included Dr. Ray Lyman Wilbur, later President of Leland Stanford University and Secretary of the Interior; Mark L. Requa, Duncan McDuffie and Ben S. Allen. Along with Hoover, who always claimed San Francisco as his home city, these men sometimes heard themselves facetiously referred to by their colleagues in the Food Administration as "The California Contingent" or "The Frisco Fussiliers." They were valiant and dedicated men, all of them; and Herbert Hoover has paid them a fine tribute in his Memoirs.

Chapter 18

SOMETHING ABOUT ROPE

With America at war, Washington was of course jammed; and Charles Merrill's recollections of his first few months there were that his office and office equipment amounted to not much more than the "room, table, chair, pencil, paper and wastepaper basket" which Hoover had designated as "standard equipment." At first he remembered being quartered in a tiny room in the Willard Hotel, then in a similar one in the Interior Department, then in a cubbyhole in the old Gordon Hotel. The latter was an antiquated place and proved too intolerable, so finally a two-story building—entirely for the Food Administration—was quickly put up. This afforded space enough for all concerned; but, being built of wallboard, it proved to be not unlike the Arctic region in winter, and the Equator in summer.

However, Merrill subscribed to Hoover's succinct statement that "enthusiasm is little dulled by temperature," and it was an enthusiastic body of men and women with which the Food Administrator surrounded himself. "Yes," said Merrill, when queried about this matter of temperature, "our quarters were not quite as hot as hades in summer and just a notch above freezing in winter. But there were always so many pressing problems demanding quick solution, that you really didn't have time to pay much attention to heat or cold or personal comfort."

Space limitations preclude anything approaching a complete recital of all that Merrill's job as Chief of the Division of Collateral Commodities embraced, but perhaps an illustrative incident or two will convey some-

thing of an adequate idea of what it entailed. One of his many responsibilities was to make sure there was no shortage of rope and twine, either for the Armed Services or the domestic economy; and to do this, he had to see that the various American cordage manufacturers were adequately supplied at all times with raw material. In peacetime, much of this had been Manila fiber, obtained from the "Abacca" plant in the Philippine Islands. But when we entered the war all our shipping was commandeered by the government and put to carrying supplies and troops to the fighting front; hence our supply of Manila fiber was cut off by lack of transportation. Likewise, our supply of the sisal we also used for rope-making in peacetime had been seriously curtailed by the war, since a great deal of it came by sea from distant points.

There was a large amount of sisal raised in Mexico; and, with other sources of supply shut off, we turned to this one. However, it soon developed that the sisal growers of Mexico knew a good thing when they saw it—or thought they did—and had decided to take advantage of the war situation to make a killing, putting up the price of their product to unconscionable heights.

How to handle this—whether, because of the emergency, to pay the price demanded, or to endeavor to get fiber elsewhere—was one of the "pressing problems" which did not allow Charlie Merrill time to realize whether his office was hot or cold.

Shortly he made his decision. Unwilling to be "held up," he elected to attempt to obtain the raw material for the rope factories elsewhere, and to this end persuaded the Shipping Board to dispatch a ship to the Philippines for a cargo of Manila fiber, meantime advising the New York agents of the Mexican sisal interests that he would not pay the exorbitant price they were asking.

Adopting this position was, Merrill freely acknowledged later, taking a great risk. For if anything happened to the ship from the Philippines, the cordage factories would soon run out of fiber and the rope shortage he was seeking to prevent would be a reality. However, he believed he knew what he was about. He believed that if he let the fact be known that he had requisitioned a ship to bring in Manila fiber, the sisal people would, so to say, get down off their high horse and come to him.

Events proved he had calculated correctly. Shortly after the press reported that the government was going to bring in fiber from Manila, Merrill received a visit from a New York attorney representing the Mexican sisal interests.

This man did not come in with his hat in his hand, however; not by any means. He tried quite another tack. After asking and being granted a private interview, he lost little time in coming to the point and making a very simple proposition. His clients had, he said, a very large quantity of excellent sisal, ready for prompt delivery; and if Merrill would see fit to agree to the price they were asking, he would be happy to make a little present of $50,000 cash to Merrill then and there!

In relating this incident to the writer, Merrill said:

> "When this fellow, who was an American citizen, tried to bribe me, it made me so furious that I had difficulty mustering the words to order him out of my office. And after he left, I kept getting still madder—to think that he thought I would accept a bribe! Well," he continued, "of course I had to get it off my chest, so I went sputtering down the hall and into Herbert Hoover's office, and blurted out the whole story to him. I was pacing around the room, and all the time the Chief just sat there, with a queer little smile hovering around his face, saying nothing. Finally, when I ran out of words—or breath—and stopped, he just grinned and said: 'They thought you were pretty cheap, didn't they, Charlie?' "

At this juncture, Merrill's emotions underwent a radical transformation. "Suddenly," he said, "I saw the humor of the situation, and burst out laughing. The way the Chief had just sat there, completely calm and unperturbed, and then dropped that sly remark about them thinking me 'pretty cheap,' took all the indignation out of me, and I went back to my office still chuckling."

That was not quite the end of the story. Merrill still wanted that sisal—at a reasonable price. So the next day, through the good offices of a

friend, who happened to be rather high up in the Department of Justice, he sent the New York lawyer a message. Just what the message contained, Merrill did not reveal to the writer. But whatever it was, its recipient came to the conclusion that it might be healthier for him—in view of what he had attempted the day before—if he advised his clients to sell their product to the U. S. A. at a reasonable price. In any event, that is precisely what they did, and Charlie Merrill got his much-needed sisal.

Chapter 19

MORE OF THE SAME

THE EPISODE RELATED in the last chapter represented the only time anyone actually attempted to bribe Charles Merrill. But there were other occasions when rather extraordinary efforts were made to "persuade" him, and when he felt that telling the story of what the New York attorney had attempted and failed to do, was the best means of warding off the repetition of such a thing. In explaining this to his chronicler, he said that what made him pretty sure this story had sometimes operated as an effective "preventive" was that several men to whom he had told it, had come to him a few days later, apologized for trying to "influence" him, and offered to do whatever he requested.

Nor was this the only sort of difficulty with which he had to deal. Since the Division which he headed included several hundred commodities that were in wide demand and vitally essential both to the successful prosecution of the war and to the preservation of a healthy national economy, it can be easily surmised what obstacles confronted him. There were, as he said, "problems standing on one another's shoulders"—no more did you get the "most pressing one" solved, than at least two others, even more pressing, took its place. There were endless meetings, discussions, conferences and arguments; and no matter how many hours you put in, at day's end there seemed to be more to do than when you started.

Though, as has been remarked, there were no more attempts actually and openly to bribe the Chief of the Division of Collateral Commodities, there were instances of defiance. There was, for example, the man—head

of a large Middle Western industrial institution which well-nigh controlled all production of a highly essential commodity—who, at the end of a long discussion which developed into an argument, virtually told Merrill where to go! He asserted with considerable vehemence that there was no law compelling him to do what Merrill asked; that even if Congress were to enact such a law it would be unconstitutional; that America had no business getting into a foreign war just to pull somebody's chestnuts out of the fire, and that, as for him, he was going out home where he belonged and attend to his business, without wasting any more time. Whereupon, he picked up his hat and stomped out of Merrill's office.

In recounting this incident, Merrill said:

> "Although I was of course greatly put out by this man's action, and perturbed concerning the impasse it created, I couldn't help but respect him for his honesty and forthrightness and for having the courage of his convictions, however wrong I considered the latter to be. Consequently, instead of taking whatever immediate action I might have had the authority to take under the circumstances, I decided to wait a couple of days and see what happened. Well, as a matter of fact, I didn't have to wait even that long. The very next afternoon that man telephoned me long distance from his home town, apologized profusely for what he had said and done the day before, and then told me: 'Mr. Merrill, you write the ticket, and I'll live up to it.' And," continued Merrill, "he did."

Quite naturally, human nature being what it is, everyone of the thousands of industrialists and businessmen coming within the jurisdiction of Merrill's office, felt that his own particular situation was the most important, and so contended—often at great length and with considerable vehemence at times. Thus, to keep all of these people if not happy (which was impossible), at least reasonably satisfied and cooperative, required something approaching the wisdom of a Solomon and the patience of a Job. Discussing it with the writer, Merrill observed:

Tribute by U. S. Food Administrator, Herbert Hoover, to Charles W. Merrill for his efficient and patriotic service during World War I.

> "I didn't have the wisdom of a Solomon, by any means, but I certainly did learn to exercise the virtue of Job's predominating trait. Perhaps I had—or could have obtained—the authority to *order* people to do certain things, or else. But I knew that wasn't the Chief's way of doing business, nor what he wanted his associates to do. Furthermore, I knew that wouldn't generate their cooperation, and their cooperation was what we had to have. So I recalled and took to heart the story Abe Lincoln used to tell about what that Illinois farmer did when he encountered a log in his field that was too heavy to move and too soggy to burn. What did he do? Well, according to Lincoln, he just 'ploughed around it,' and in a good many cases that is just what I had to do and did."

As has already been mentioned, Charles Merrill looked back upon his World War I services as one of the two most satisfying things he had ever done. And he remarked again and again that this was due, apart from the natural gratification accruing of rendering patriotic service to his country, to the privilege of working for and with Herbert Hoover, for whom he had a deep affection, and whose wisdom he never ceased to applaud. Of the latter, in a letter which he wrote to a friend in June, 1955, Merrill said:

> "I am setting down a thought which has occurred to me a thousand times I suppose, concerning the wisdom displayed by Herbert Hoover in his conduct of the Food Administration. In his selections for the heads of Divisions, Hoover picked men who had no connection with the industries that they governed; then gave them a free hand in selecting members of their staffs from those particular industries, but required that no order could go out without the approval of the independent head of that Division. In my opinion that is why that great Institution functioned so effectively, and all without even a breath of scandal."

* * *

It might be added that, among the rapidly thinning ranks of those men who learned—and loved—to call Herbert Hoover "Chief" during the now distant and dimming days of World War I, Charlie Merrill's appraisal of their "Chief" is completely shared.

Charles Merrill remained in Washington, as head of the Division of Collateral Commodities, for the duration of the war. And then, as he phrased it, "I turned in my 'uniform'—my desk, pencil, paper and waste-paper basket—and returned to San Francisco, to get acquainted with my family and my business associates again."

Chapter 20

PROOF OF THE PUDDING

When Charles Merrill was earlier describing how he chose his associates in establishing The Merrill Company, he stated that the Company functioned as effectively during the nearly two years his time and attention were fully occupied by his Washington war work as if he had not been absent from San Francisco. And he went on to say that he believed the reason for this was "the care and the fundamental engineering principles I had used in selecting my co-workers years before."

In stating that The Merrill Company's business had not suffered by his absence, Merrill was not "throwing bouquets" at his associates, or merely being polite. He was testifying from the record, so to say, of what the Company had accomplished during those two years—years which were, without question, very difficult ones.

They were difficult because the war engendered, directly or indirectly, tremendous and far-reaching dislocations of business and industry. Before entering the war, America had lent vast sums of money to Great Britain and France and sold them enormous quantities of munitions and other necessary war supplies, but this had not caused too much interference with normal business and industrial activity. However, once America intervened, she proceeded as rapidly as possible to convert the nation to a war economy, and those sectors of business and industry which were not proximately essential to the war effort suffered serious dislocations.

Gold and silver mining were not considered essential to the successful prosecution of the war; hence, for many reasons—including shortage of

manpower and equipment—it was difficult, if not impossible, to operate. Some mines continued operating on a limited basis; others shut down entirely. Though perhaps to a lesser extent, this was true even in Central and South American countries, which were all more or less affected—in one way or another—by the war.

With the gold and silver mining industry thus restricted and hampered, The Merrill Company's regular business suffered a marked decline, since the major portion of it up to that time had consisted in the sale and installation of the equipment, processes, etc., which Charles W. Merrill had developed or perfected—and patented—for the treatment of gold and silver ores.

It was here that the organization which Merrill has described and lauded, came to the rescue. Instead of sitting the war out, and waiting to take up anew when it finally terminated, the men Merrill had chosen as his associates and partners in The Merrill Company began "scouring" the world—or at least that portion of it which was nonbelligerent—to find possible new sources of business.

It may be well to remark parenthetically that, in the growth and development of his organization, Merrill had come to delegate specific activities to each of his associates. There was no inflexible rule, and all matters were subject to general discussion. But, generally speaking, Charles C. Broadwater acted as business manager and Herbert S. Shuey as financial chief. Frank H. Ricker took charge of designing, and Louis D. Mills was delegated (sometimes with Ricker's assistance) to install the Merrill equipment and processes at the mines and to advise on their operations and controls.

Thus it was that The Merrill Company's chief "Foreign Scout" was generally Lou Mills. As the "trouble-shooter," he was frequently being called, at short notice, to far-off places—either to investigate and determine whether or not Merrill processes and equipment could solve some mining problem or be otherwise profitably employed, or to discover why the processes and/or equipment were not performing to their fullest effectiveness. In this capacity he roamed from The Rand in South Africa, to Canada, Mexico and Central and South America. Besides being known

as an exceptionally capable metallurgical engineer, Mills was noted for a sort of sixth sense for finding defects or errors and curing them, so his advice and services were in large demand.

Another salient characteristic of Mills was that of keeping his eyes wide open wherever he went. Thus, whenever he made a trip—for whatever purpose—he always was looking for another mine where Merrill processes or equipment could be installed, or for a new product or process which The Merrill Company might take over and exploit.

An interesting example of this occurred early in 1918. Mills was on a trip to visit mining plants in Mexico, and at Pachuca inspected the plant of the Real del Monte Mine with its general manager, who was an old friend. As Herbert Shuey recalls the story, Mills, while touring the plant, stumbled over something and nearly took a bad fall. Looking to see what this was, he saw something that was strange to him and asked the manager what it was. The latter replied that it was a new kind of valve, involving a new principle in valves—that of lubrication—which had been invented by a man named Nordstrom. Inquiring as to the identity of Nordstrom, he learned that he was a Swedish gentleman who had been in Mexico for several years and was now living at the American Club in Mexico City.

Mills then proceeded to give the valve a thorough inspection, and made pertinent inquiries as to its purposes and performance. From all this, he concluded that it had possibilities; and so, after finishing his work at the Real del Monte, he went to Mexico City and looked up Nordstrom.

The two men liked each other at once, and soon were good friends. Mills told Nordstrom that he thought well of his valve and wanted to know if he had made any plans for its distribution outside Mexico. Nordstrom advised that he had not, and that he was not particularly interested in so doing, since he already was receiving a very good income from royalties paid him by Mexican mining companies which were using his valve. Each mining company, he said, made its own valves in its own shops, from drawings and specifications which he prepared.

Not being a person who gave up easily, Mills persisted in his importunities and finally obtained from the inventor a provisional promise.

Nordstrom promised that if he ever decided to consider world-wide distribution he would give The Merrill Company first chance, provided that a Chicago concern—a large manufacturer of valves—was not interested. He explained that he had told them he would let them see his valve; and, although not very sanguine about their wanting it, he must at least keep his promise.

Mills returned to San Francisco and, in a letter to Nordstrom, confirmed all that he had previously said about the valve. Apparently this letter operated as the convincing "straw," for a short time later Nordstrom appeared at The Merrill Company's offices in San Francisco to see Mills. He had, he explained, been to Chicago and fulfilled his promise by offering distribution of his valve to the company there. However, their engineers had told him they did not consider it of any particular value and would not care to handle it. So—here he was, and did Lou Mills still want to talk about taking over the valve and distributing it? Mills certainly did. And Charles Merrill, having by now completed his Washington assignment and returned to San Francisco, approved. Accordingly, an agreement was worked out whereby The Merrill Company took over the entire development of the valve and its distribution throughout the entire world.

As an account of the operations of Merco Nordstrom Valve Company (a Merrill Company subsidiary) will appear in a subsequent chapter, suffice it to say here that Lou Mills' "stumble" at the gold mine in Mexico turned into a new opportunity for The Merrill Company, as well as for the Swedish inventor.

The success of Mills in persuading Nordstrom to bring his valve to The Merrill Company was one example of how Charlie Merrill's associates performed while he was in Washington serving his country. He had believed that the organization he had established would function effectively for his ideals, ideas and purposes. Now, he *knew* it—here was "the proof of the pudding."

Chapter 21

PERSONS AND PERSONALITIES

INASMUCH AS the primary purpose of this book is to provide a record of the life and achievements of Charles Washington Merrill, it is unnecessary to apologize for his being its dominant theme and central figure. He had achieved individual success and gained international renown before establishing a firm of a partnership nature. Moreover, his processes, methods, and equipment—and the patents covering the same—constituted the stock in trade, as it were, of this firm. In short, this collective enterprise—The Merrill Company—had its genesis in Charles W. Merrill's metallurgical accomplishments and, in the beginning, WAS Charles W. Merrill dressed in partnership or corporate clothes. Hence, any history or historical narrative concerning The Merrill Company, and its various subsidiaries and affiliates, must of necessity revolve around this one man.

However, it would be playing false to Charles W. Merrill, and be a negation of his attitude and desire, to fail to accord to those men he invited to be his associates and made his life-time partners, the tribute which he, while living, delighted to pay them.

Perhaps no man ever lived who was less uncertain of precisely what he could do than Charles Merrill. An engineer in the fullest and widest possible sense of the word, he had calculated and appraised his own capacities as unemotionally and as meticulously and completely as he ever calculated and appraised any engineering problem, process or method. By the same token, he knew just as precisely his own limitations, and was as

unhesitant to admit them as he was certain of his capabilities. Consequently, in selecting associates to join with him in a life partnership of engineering and business, he chose men he believed could and would complement him; men who could and would—individually and collectively—supply the capacities he lacked.

Thus, while Charles C. Broadwater was a graduate of the London Royal School of Mines, Merrill chose him for his business ability rather than for his mining knowledge and proficiency. And, having chosen him for this reason, he delegated to him the handling of the business aspects of the operations of The Merrill Company and its subsidiaries. He had discovered Broadwater's business proclivities during the time the latter was one of his assistants at Homestake. The same held true for Messrs. Mills and Ricker, who were also with him at Homestake, and for Herbert S. Shuey. Mills, a graduate of Stanford University in Metallurgical Engineering, was assigned to technical problems, research and direct contacts with mining companies; and Ricker, who held the degree of Mechanical Engineer from Iowa State College, was given charge of mechanical problems—particularly those of design. And Shuey, a graduate of the University of California, found his major duties in the field of finance and accounting. Each excellent in his specialty, taken collectively they made a splendid team for Merrill to captain.

Charles Merrill, in reminiscing to the writer, often referred to his associates as "The Big Four," and spoke of them in a manner that left no doubt of the great respect he had for their abilities and the deep affection in which he held them. But to specific questions concerning the personalities of the first three—Messrs. Broadwater, Mills and Ricker—he invariably said: "Ask Herbert Shuey. He served with them almost as long as I did; he knew them all intimately, and he is better at remembering this sort of thing than I am."

As this is written, Herbert S. Shuey, Vice President and a Director of The Merrill Company, is the only one of Charles Merrill's four original associates still active in the firm. Louis Mills died in 1943, Charles Broadwater retired in 1932 and died in 1954, and Frank Ricker retired in 1947. Consequently, it has been mainly from and through Herbert

Charles W. Merrill at Berkeley Tennis Club,
around 1920.

Shuey that we have obtained information and anecdotes concerning the personalities—the whims and human caprices—of the three men, who, together with him, constituted Charles Merrill's "Big Four."

Charles Broadwater was the sort of man who usually scares the new employee, particularly the very young or inexperienced one. He was very frank; he expressed his opinions in no uncertain terms and ofttimes with amusing piquancy; and, as Edmund Matheson (who joined The Merrill Company in 1920 as a youth) recently put it: "He was a bit terrifying at first." But actually, as anyone soon discovered, it was all bark and not bite, and those who dealt with him quickly came to enjoy it. In his letter of recollections, Matheson, now an official of Rockwell Manufacturing Company in the manufacture of the Merco Nordstrom Valve, goes on to say of Broadwater: "But I very soon found out that he had a big warm heart under his gruff exterior, and that I could feel at ease with him also." And to illustrate, Matheson cites the following incident:

> "Shortly after I came with the Company my wife fell ill and two doctors had said that she had an impaired heart and would have to live a restricted life. Feeling that Mr. Broadwater knew almost everybody of importance anywhere, I went to him and asked him to recommend the best heart specialist on the West Coast. Thereupon he gave me the best piece of medical advice I have ever had. He said, 'You don't want the best heart specialist on the Pacific Coast; you want the best *diagnostician,* and I know him.' He thereupon arranged, personally, for a friend to see my wife and diagnose her case. It turned out that her heart was all right, and that she had heart symptoms from an infected thyroid, which the doctor proceeded to cure. That, I have never forgotten."

Edmund Matheson says further that although he felt very much like a "lost cat" the day he reported to go to work for The Merrill Company, after he had met all the staff he was "struck at once by the friendly family feeling in the organization, and the way you all made me feel completely at home. I soon found that this spirit carried through to the top and emanated from Mr. Merrill himself."

One of Charlie Broadwater's ardent passions was baseball, and Herbert Shuey recalls that, as the Company's business grew and Broadwater had to make several eastern business trips a year, he always managed to make his Fall trip coincide, somehow, with the World Series.

Louis D. Mills—Lou Mills, as everyone called him—was quite a different personality than Charles Broadwater, though not a less colorful one. He also was a man of strong convictions; and, although he might not voice them as loudly as Broadwater, he defended them with no less vigor and adhered to them perhaps even more tenaciously. After Thomas B. Crowe, another able metallurgical engineer, had joined The Merrill Company—bringing with him a process which he and Charles Merrill developed into the celebrated Merrill-Crowe Precipitation Process—Mills and Crowe became great cronies. Both enthusiasts for their chosen profession, and both extremely capable in it, they would work together on some problem most assiduously, as harmonious as two kittens. Then, all of a sudden, the tension would tell, and they would have a row and not speak to each other for two or three days—during which time each was most unhappy. Then sometimes one, sometimes the other, would admit to being in the wrong, and back they were as cronies again. Both of them "loved their chawin' tobacco," says a friend who worked with them and knew them both intimately, and "seemed to vie with each other as to which could chaw the faster." Writing of these two men, H. B. Whitmore, for many years with The Merrill Company and now owner of Whitco Equipment, Ltd., of Toronto, Canada, said in a letter to Herbert Shuey in May, 1956:

> "In my travels (for The Merrill Company) I usually described Lou Mills and Tom Crowe as 'the Damon & Pythias of the mining industry.' Lou revelled in thinking he was cantankerous, and I think he fooled Tom more than others. Tom often took him too seriously; and, supersensitive as Tom was, he would be dispirited for days after the slightest tiff with Lou, whom he thought the world of. Lou always had to be right or else. For example, before I knew him better, I once had the temerity to disagree with him

> on some issues. A couple of days later I said, 'Lou, I guess I was wrong on that point the other day.' His face lit up and he barked back: 'Good; if you'll admit that, I'll confess I was wrong on the other point.' That was typical of him, to those of us who worked for him—lovably cantankerous."

In this same letter, Whitmore recalls that "the question of who was the better metallurgist, or whether some ore should be floated first or cyanided first," were not the only questions Lou Mills and Tom Crowe argued and rowed about. They loved to play at being "pioneers," and would use sleeping bags and cook over a campfire, in preference to going to a hotel when they would take a trip into the Grass Valley mining regions. But here again they would get into heated arguments—over which was the better, more rugged pioneer. There was one time, writes Whitmore, when they had an especially big argument. This one was entirely concerned with who should cook the breakfast, and was "all predicated on their respective methods and prowess in flap-jack manufacture. Apparently they didn't agree on methods, ingredients or anything else. As a result they got so damned mad that they didn't have breakfast, but packed up and headed for home without completing the trip; and, although seeing each other every day, they were not on speaking terms for a couple of weeks. Until then, they both suffered."

Chapter 22

MORE OF "PERSONS AND PERSONALITIES"

STILL WRITING of his old friend, Lou Mills, and of Lou's eccentricities, H. B. Whitmore says:

> "Another thing he stressed was that the mining fraternity was 'a different breed of cats,' and that The Merrill Company's procedures, policies and methods of doing business were 'unique.' Of the latter I became aware when I first came to Toronto . . ."

It seems that in the late 'twenties some of the Canadian gold mines were having quite a struggle, and that Mills was prone to be lenient about license payments owed The Merrill Company until and if they were able to make payment. Says Whitmore:

> "One such, in the Kirkland Lake area, came along nicely later, but nothing was ever done (about payment) and then Lou blandly told me to collect. In the interim the management had changed hands, and there had been nothing in writing. I told the new manager the story—that it was simply a gentlemen's agreement, etc., etc. Quite understandably he said he had never heard of such an improbable story, nor, if true, of such an asinine way of doing business. But being backed by The Merrill Company reputation, and the mine having no record of payment, the manager, after several discussions, finally said: 'Suppose we refuse to pay—

> are you going to sue us?' I said, 'Oh, I doubt it. The Merrill Company has never had to sue anybody.' To which he replied, rather resignedly, 'Yeh, but I suppose you'll think we're a bunch of - - - - .' They paid—proving both the 'unique' and the 'breed of cats' theory."

Mr. Whitmore ends his letter by remarking that if the Merrill book is to devote some of its pages "to the type of men Mr. C. W. surrounded himself with, then Lou Mills and Tom Crowe of course are of the essence," because he feels that they were "the ones who did most to make the organization reputed for its technical ability and its colorful and amiable reputation in the gold and silver camps around the world."

"In the gold and silver mining camps around the world" is no idle claim, for either The Merrill Company's reputation or that of Lou Mills. For from the far-off Rand of South Africa come more reminiscences concerning both. Through the good offices of Herbert Shuey the writer made contact with a life-long friend of Charlie Merrill and Lou Mills—Frederick Wartenweiler, of Johannesburg, South Africa, a distinguished metallurgical engineer, now retired.

Mills and Wartenweiler and Merrill all met at The Homestake when Mills was working for Merrill as an operating shiftman, and Wartenweiler was working for Homestake in a similar capacity. Of this and later association with Mills, Wartenweiler writes:

> "We became good friends, and being on the same shift managed to visit the neighborhood of the Homestake and obtain a good insight of metallurgical operations in that district. During summer, Lou introduced me to the fine art of trout fishing, he himself being an expert. This sporting association continued, and we fished in California, Canada and South Africa."

After the Homestake days together, the next professional association of Mills and Wartenweiler was on the Witwatersrand in South Africa in 1911-12, where Wartenweiler was serving as Consulting Metallurgist for

the Central Mining Corporation, in whose mills several Merrill Precipitation Plants had been installed. "It became apparent," writes Wartenweiler "that there was scope for improvement in the process." Accordingly, he, in conjunction with other metallurgical engineers of the area, asked The Merrill Company to send Mills to South Africa. Says Wartenweiler:

> "He came, accompanied by the delightful Mrs. Mills, and set himself to the task. Out of this was developed the vacuum filter equipment which has become standard in this field and is generally used. In conjunction with this, The Merrill-Crowe method of deaeration of pregnant cyanide solution became general practice. . . . Our friendship—between Lou and myself—was steadfast, and I have mourned his early death. Our joint technical association and our social life were of a most satisfying and friendly nature, and brought us many friends. I might mention one—the late Carlton Jones—a fishing companion and at one time head of the New Goldfields Group. He has now gone and so has Lou Mills, who sent me a cable the day before his death, with the old fisherman's greeting
> 'Tight Lines'."

Frederick Wartenweiler was not the only one who mourned Lou Mills' early death. As Charles Merrill remarked a few months before his own death: "Lou's going left a place in our ranks that no one could fill."

Frank H. Ricker, now retired from active participation in the affairs of The Merrill Company, Merco Nordstrom Valve Co., and the Rockwell Manufacturing Co., and living in Berkeley, is the only one left of the three young men who cut their eyeteeth, metallurgically speaking, working for "Cyanide Charlie" Merrill at The Homestake Mine back around the turn of the century.

Just graduated from Iowa State College, Ricker came out to North Dakota to test traction engines. He contracted typhoid fever and, after recovering from the first ravages of the disease, returned to his home in Grinnell, Iowa, to recuperate. While there he received a letter from one

ANNUAL MILLING NUMBER
Engineering and Mining Journal
McGraw-Hill Co., Inc.
Price, 50c.
New York, June 28, 1919
A SELF-LUBRICATING PLUG VALVE
"It won't stick — and it won't leak"
LUBRICATION SCREW
ELASTIC PACKING
GREASE DUCT
90 DEGREE STOP
ANTI-FRICTION WASHER
GREASE CHANNELS
GREASE CHAMBER
THE NORDSTROM LUBRICATED PLUG VALVE
There's only one of its kind — use it on all water and air lines — cyanide solution, ore pulp lines and general mine and mill piping — you will know then what freedom from valve trouble really means.
The Nordstrom Lubricated Plug Valve is a demonstrated success — it will be abundantly worth your while to write for complete details.
"A turn of the grease screw (with the fingers), a half turn of the handle and the valve is opened or closed."
"The plug cock with 100% opening."
Send for catalog
Our Special Grease Cartridges Supplied For All Sizes
THE MERRILL COMPANY
121 Second St.
San Francisco, California.

One of first advertisements of the Nordstrom Lubricated Plug Valve—June 28, 1919.

of his college classmates—Archie Scott—that if he would come out to Lead, South Dakota, he could have a job drafting, with a metallurgist named C. W. Merrill, at $3 a day. As soon as he was fully well, Ricker came out and took the job, thus beginning a professional and business association that was to continue until his retirement from The Merrill Company almost half a century later, and establishing a friendship that did not terminate until Charles Merrill's death in 1956.

Altogether different in personality from either Charles Broadwater or Louis Mills, Frank Ricker complemented both in his capacities, and was frequently a conciliating intermediary between two men who were addicted to vigorous pronouncement of ofttimes contrary opinions. With less idiosyncrasies than either of the others, he exercised a soothing influence on both, and had a way of preventing mountains being made of molehills. He was ingenious in solving mechanical problems and became an expert in the design of mining plants and equipment; and, although not fond of travel, frequently accompanied Mills on field trips to mines where a Merrill installation presented ticklish mechanical problems. Also, he went out in Mills' place, when the latter had too many assignments to cover at one time. Ricker was Secretary and Director of The Merrill Company for many years; and, when the Merco-Nordstrom Valve Company was organized, he was made Production Manager of its manufacturing plant in Oakland, California.

Whereas Charlie Broadwater was an ardent devotee of baseball, and Lou Mills an angling enthusiast, Ricker's preferred recreation was cultivating his flower garden, or working in the laboratory on some long-range mechanical problem. By nature calm and imperturable, and given to working as well as expressing his opinions quietly, Ricker did not attempt to compete with either Mills or Broadwater for the title of "most colorful character." Consequently, he could never have been the "villian" (or the "hero") of the incident about to be related.

The account of this incident rather suggests that it was apocryphal, and no one in the Merrill organization is disposed to take oath as to whether Mills or Broadwater was the man chiefly involved. However, judging by their variant vagaries and caprices, it might have been either.

In any event, it is too good a story to be left untold; so we will tell it and, arbitrarily, give Mills the title rôle.

As the story goes, Lou Mills was in his office one Saturday afternoon (yes, people used to work on Saturdays), trying to get a friend of his, who had offices right across the street from The Merrill Company, on the phone. The operator—it was long before the advent of dial phones—said "they do not answer," so Mills hung up, waited a few minutes, then tried again. Once more getting the same answer, Lou hung up and waited ten or fifteen minutes before making another try. The third call brought the same response from Operator, but by now Lou was looking out the window and could SEE his friend seated at his desk. That was TOO much; and he told the operator, in a loud voice and no uncertain terms, what he thought of her inefficiency, stupidity, asininity, and what not; then hung up with a bang.

A minute or two later, as he was putting on his hat to go across the street and call on his friend, it suddenly dawned on him that he had been calling the wrong number—the number, in fact, of quite another friend. Carrying both numbers in his head, he had simply, and absent-mindedly, transposed them.

Well, when Lou realized his *faux pas,* he didn't go over and call on his friend. Instead, he called one of the Head Operators of the phone company and obtained the name of the operator he had "blown up." Next, he went to the nearest Haas Bros. store and bought a ten-pound box of candy and had it wrapped with lots of ribbon. Armed with this, he went to the telephone office, hunted up the operator in question, told her of his mistake and apologized profusely for it, then presented her with the candy! But it was many months before Lou confessed this to one of his associates—probably Tom Crowe—and then only after extracting from him one of those pledges of "secrecy" that are meant to be broken; hence this story.

"Yes," said Herbert Shuey, in reminiscing of the old days, "Mills and Broadwater and Ricker certainly were a wonderful trio. Taken individually, each was infinitely capable in his special field. And working together—for and with Charles Merrill—they were an absolutely unbeatable team."

Chapter 23

BETTERING WHATEVER HE TOUCHED

SOMEONE HAS SAID that "Whatever Charles Merrill touched he bettered," and his chronicler has found nothing that does not validate that succinct statement.

This is not to suggest that he was a man beyond error. Indeed, he held with Theodore Roosevelt that "the only man who never makes a mistake is the man who never does anything." And he took pains to emphasize that many of his fundamental and far-reaching contributions to metallurgy and metallurgical practice were developed and perfected through extensive experimentation which involved trial and error.

Likewise, Merrill always was outspoken in insisting that full credit be accorded his associates and others for their shares in the development and perfection of many of the metallurgical processes, methods, inventions, etc., which were carried to world-wide success by The Merrill Company. Invariably, he stressed the fact that credit for the basic idea or principle of some of the most successful of these should go to others, pointing out that his part was to discover and cure practical defects, so that the process or method or invention could be developed and put into successful use, and then marketed under the prestige of his Company's good will and reputation.

As an example of the latter, we have the now world-famous and almost universally used valve which, as previously related, was found by Louis D. Mills of The Merrill Company when he almost fell over it while on an inspection of a Mexican gold mine.

This valve—the Nordstrom Valve as it is known in world markets

today—was a rather simple thing. Behind its ultimate great success, however, lay many years of hard engineering and development work, and persistent and skillful merchandising by The Merrill Company.

In 1918, when Mills first saw it and met its inventor, Sven J. Nordstrom, this valve was in use by only a comparatively few mining companies in Mexico, and completely unknown throughout all the rest of the world. It was Mills' capacity to perceive its possibilities, and his persistence in pointing these out to the inventor, that brought the valve to The Merrill Company. And it was the ability of Charles Merrill and his associates to engineer, develop and merchandise it that brought it world-wide acceptance.

The full, detailed history of the Nordstrom Valve, after it was taken over by The Merrill Company, cannot be given here. What follows is merely a brief statement of the highlights of its essential history.

To do all that The Merrill Company's contract with inventor Nordstrom called for, represented an undertaking of magnitude and complexity. Likewise, it required a great deal of time and of hard, painstaking technical work, since many modifications had to be made, in design and other respects, so that it could comply with the diverse requirements of the numerous industries to which it was made available. Furthermore, to these industries this valve was a totally new kind of mechanism, involving a new principle; hence time, persistence and genuinely scientific selling were required on the part of The Merrill Company to convince engineers and other technical men that here was something they could advantageously use in their respective industries. Moreover, complaints from users were many times answered only to find that its valves, whose essence was the ability to be lubricated, *had not been lubricated*—as though one expected an automobile to run without oil!

For a number of years the financial requirements were much greater than obtainable profits, and many were its ups and downs. At one time the discouraging factors were such that Charles Merrill asked one of his associates if he thought it would be possible to recover the amount that had been invested from any group or company. His associate frankly said "No," whereupon Merrill said: "I thought you would say no, so we'll

go ahead and invest more, and I'm sure our faith and efforts will in the end be rewarded."

For about five years all operations involved in the handling of this valve were carried on by The Merrill Company. Then, in 1924, with world-wide demand for it steadily and rapidly increasing, the Merco* Nordstrom Valve Company was organized (as a subsidiary of The Merrill Company) to handle the valve exclusively, and a plant was established in Oakland, California, to manufacture the valve in a variety of types and sizes, and a wide range of metals and alloys.

The principal officers of the Merco Nordstrom Valve Company were: Charles C. Broadwater, President; Sven J. Nordstrom, Vice President; Herbert S. Shuey, Secretary-Treasurer; Comfort E. Brown, Vice President in Charge of Sales; Frank H. Ricker, Production Manager, and Edward D. Rogers, General Sales Manager. The Directors were Messrs. Charles Merrill, Broadwater, Nordstrom, Mills and Shuey; and other key members of the staff were Daniel N. Whitlock, Assistant General Sales Manager; Earl D. Moiles, Assistant Production Manager; George F. Scherer, Technical Engineer, and Edwin M. Carter, Assistant Secretary.

Head offices were in San Francisco. Production, purchasing and shipping departments were at the Oakland plant, and branch sales offices were established in other principal cities.

Through the intensive efforts of the engineers of both The Merrill Company and the Merco Nordstrom Valve Company, and the valued cooperation of engineers in various industries, the Nordstrom Valve was adapted for use in a large number of processes in many different industries.

The growth in the demand of the Nordstrom Valve, as handled first by The Merrill Company and then by Merco Nordstrom Valve Company, is well attested by the following sales record:

YEAR	SALES
1919	$ 600.00
1920	32,000.00
1921	56,000.00
1922-1932, inc.	15,000,000.00

*Merco is an abbreviation of Merrill Company.

Sales of the Nordstrom Valve have amounted to many millions of dollars more since 1932, when the business was merged with the Pittsburgh Equitable Meter Company, the latter now a division of the Rockwell Manufacturing Company. Under the terms of the merger The Merrill Company retained, and still retains, its interest in the business. Sven J. Nordstrom was a Director until his death in 1951; and Herbert S. Shuey and John L. Merrill have been Directors of the Pittsburgh Equitable Meter Company and/or the Rockwell Manufacturing Company from the time of the merger until the present.

The man who said "Whatever Charles Merrill touched he bettered," needs no more corroboration than the record of the Nordstrom Valve.

Chapter 24

A BRIDGE FOR HUMANITY

"THE PATHS OF MEN come upon chasms and torrents, marshy shores and yielding sand. The primitive course is to turn back, go around or make a slow passage over. Primitive people build little bridges. A great bridge is possible only with integrity, goodwill, cooperation, courage, intelligence and perseverance. Citizens of San Francisco, your Community Chest is building a bridge far more enduring, far more useful for the future of humanity than any material structure could possibly be."

In these words Charles Merrill opened an address by radio to the people of San Francisco at the start of a city-wide campaign to fill the Community Chest of 1926. He spoke as Chairman of the Executive Committee of the Community Chest, a position in which he served the people of his city with rich enthusiasm and effectiveness for three successive years.

Serving with him on that Committee were community leaders from all walks of life—Wallace Alexander, W. I. Brobeck, Selah Chamberlain, Fred Dohrmann, Jr., William H. Crocker, Milton H. Esberg, Charles W. Fay, Charles K. Field, Col. George Filmer, Mark Gerstle, Andrew G. Griffin, Morgan A. Gunst, Lawrence W. Harris, Alfred Ghirardelli, Mortimer Fleishhacker, Henry Q. Hawes, Reuben B. Hale, F. L. Lipman, C. F. Michaels, James K. Moffitt, Charles K. McIntosh, Rt. Rev. Edward L. Parsons, Mnsgr. Charles A. Ramm, Judge M. C. Sloss and Dr. Ray Lyman Wilbur, to name some of them.

That he should have been chosen to head a committee composed of such men is at once proof of Charles Merrill's eminence in the community and of the regard in which his character and ability were held by its leaders. That he rendered to the community the same quality of high-minded and effective service as he had earlier to the nation, is attested by the records of The Community Chest itself.

Consistent with his characteristic forthrightness, Merrill was frank to tell the writer that he had accepted the call to this service reluctantly. In discussing this aspect, he explained that, just as he had been at first annoyed when Herbert Hoover had requested him to serve with him in the U. S. Food Administration during World War I, so was he when Milton Esberg and Wallace Alexander came in one day and asked him to head the Community Chest.

In the first place, he thoroughly disliked personal publicity and realized that, in the nature of things, a man in this position could not possibly escape it. Then, he was not an orator—had always shied away from public speaking, and knew that in this rôle he would be called upon to make many public speeches. And, finally, his professional and business commitments were making such demands upon him that he did not see how he could find the time which this community service would entail. All of these things taken together created a frame of mind which made him, as he expressed it, "downright put out at Milton Esberg and Wallace Alexander for putting me on the spot."

However, again as in the case of the request from Herbert Hoover, Merrill couldn't bring himself to refuse. If for no other reason, his affection for Alexander and Esberg—as for Hoover—made a negative answer next to impossible. And that, as he explained, was partly what upset him. "I wanted to tell them 'no' but I couldn't. I asked for a couple of days to think it over, but that was really a bit of camouflage—I knew when those two old friends went out the door that I was going to say 'yes,' which is, of course, what I did when they came back at the appointed time for my answer."

Once he had given an affirmative answer, Merrill quickly forgot all his reluctance and annoyance, forgot even that he had ever been inclined

to say "no," and plunged into this new task with characteristic vigor, enthusiasm and devotion.

For the next three years the San Francisco Community Chest occupied first place in Charles Merrill's heart and mind, and, however pressing his own affairs were, was accorded first place in his time and attention. In his youth, his old friend and mentor, Alexis Janin, had admonished him: "Once you put your hand to the plow, go through to the end of the furrow," and he had always taken that advice to heart. That was the secret of his success at The Homestake—once he started the project, he permitted nothing to sidetrack him, allowed nothing to preclude his *carrying through*.

When Merrill became the Chairman of its Executive Committee, the Community Chest of San Francisco was still in the fledgling stage. Organized in an endeavor to bring order, efficiency and economical management into the raising and administration of charitable funds, it was, when Merrill became its head, still facing the necessity of justifying itself with the public through proving itself superior to the mechanisms it had replaced.

Previous to the origin of the Chest, every San Francisco organization devoted to charity had conducted its own special, individual drive for funds, with the result that there was scarcely a time throughout the year when one or another of these money-raising efforts was not going on. This, it was felt, tended to make the public somewhat callous and apathetic. Moreover, and this was most important, there was great duplication of effort, with consequent inefficiency and waste. What was needed, in lieu of this, was something that, while keeping the heart in charity, would bring to the necessary mechanics of its operation, business organization, order and efficiency. This, the Community Chest was created to do, and capable of doing, but at the time that Charles Merrill accepted its leadership, it was still so new and unfamiliar—as an idea—that the public had not completely accepted it. Thus, a part of the task to which Merrill and his associates had to devote themselves consisted in convincing the public; in "selling" the idea and the ideal of the Community Chest to the people of San Francisco.

This was not anything that could be quickly or easily done; moreover,

to some extent at least, it had to be done over again each year when the fund-raising campaign was on. During the period, each year, when the Chest's "drive" was in progress, there were almost numberless meetings of the Executive Committee—sometimes by day, sometimes by night; and there was scarcely a day when Merrill, as Chairman, was not called upon to speak three, four or five times to different gatherings.

Nor did the Committee's work cease or even much diminish when the public campaign for funds terminated. There were always the manifold problems of the proper allocation of the funds and their efficient administration, problems that in their nature were both complex and delicate. To conscientious men, the responsibility of administering other people's money—especially money given for the noble purpose of helping the unfortunate and alleviating human suffering and misfortune—is a very heavy one. There were many days when Merrill did not even appear at his own office; there were nights, many of them, when he did not reach home until long after midnight. The testimony of those few still in our midst who served with him is that he never spared himself, never gave less than his fullest and most enthusiastic effort to all the affairs of the Chest during the three years he was its head.

But to Charles Merrill all this was a labor of love, in the fullest sense; far from begrudging the time and effort he devoted to serving, he did it willingly, gladly; and to the end of his long life remembrance of it brought him immeasurable satisfaction. To the writer he said again and again that the two things which, throughout his whole life, had brought him the highest, the most enduring and unalloyed gratification, were his service to the nation under Herbert Hoover and his service to San Francisco through the Community Chest. He believed, as he had said, that the Chest was "building a bridge for humanity," and he was proud and happy to have had a part in the construction of this noble edifice.

Chapter 25

A "PEOPLE'S FOUNDATION"

SAN FRANCISCO, *July 12, 1926 (A.P.)—Fourteen of San Francisco's wealthiest men, representing fortunes in excess of $100,000,000, today formed a community foundation under which millions of the surplus wealth of the richer families will be donated to the future benefit of the community as a whole. . . .*

Charles W. Merrill was appointed Chairman, with instructions to name a committee authorized to study the Rockefeller and Russell Sage Foundations and all other leading community funds in American cities. Organization details will be perfected at a meeting in October. The call for today's meeting was issued by Mr. Merrill, William H. Crocker, banker and Republican National Committeeman from California; Mortimer Fleishhacker, banker and member of the Board of Regents of the University of California; Paul Shoup, railroad executive and member of the Board of Trustees of Stanford University, and Clay Miller, merchant and former President of the Chamber of Commerce here. The idea came from the Community Foundation of Cleveland, devised by the late F. H. Goff of that city.

So read, in part, an article published by the New York WORLD on July 13, 1926.

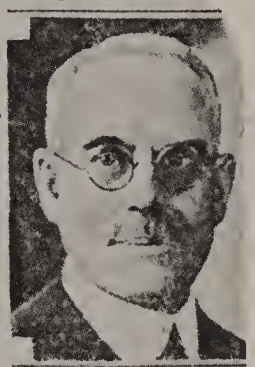
The fourteen men (there were really 14 men and 1 woman) named in the article were Charles W. Merrill, William Wallace Campbell, Selah Chamberlain, Colbert Coldwell, William H. Crocker, S. P. Eastman,

Fourteen Capitalists Organize

Foundation to Protect Bequests

WILLIAM H. CROCKER — COLBERT COLDWELL

Capital in Excess of $100,000,000 Represented at Luncheon Where C. W. Merrill Succeeded in Launching Plan for City of San Francisco



F. L. LIPMAN

WILLIAM W. CAMPBELL

Special Despatch to The World

SAN FRANCISCO, Aug. 7.—Designed to create a permanent machine for receiving and administering bequests for philanthropic purposes in such a way as to make possible the intelligent use of such funds "for all times," fourteen of San Francisco's wealthiest men have taken initial steps toward the organization of what is to be known as the San Francisco Foundation.

Preliminary organization of the foundation was effected recently at a dinner at which the fourteen capitalists, headed by Charles W. Merrill, one of the most active figures in local philanthropical work, pledged themselves to the common cause and announced plans for drawing into their circle hundreds of others of the city's persons of wealth. Capital in excess of $100,000,000 was represented at the luncheon meeting that prefaced the organization work.

In effect, members of the group stated, the meeting was the initial effort toward organizing millions of the surplus wealth of the richer families of San Francisco for the future benefit of the community as a whole.

Under the plans of the proposed foundation, while a bequest might be made for certain specific charitable, scientific research, educational or other philanthropical purposes, its actual use after the donor's death would be governed by changing community needs, these to be determined by a self-perpetuating Board of Trustees.

Members of the group of capitalists declared a thorough study of every phase of their plan, coupled with consultation with competent legal authorities, had convinced them the steps contemplated were entirely legal and would not only not affect the intent and purposes of philanthropic bequests, but would enhance their value.

The fourteen millionaires participating in the initial movement and in attendance at the recent luncheon included, besides Merrill, the following: William Wallace Campbell, President of the University of California; Selah Chamberlain, Colbert Coldwell, William H. Crocker, S. P. Eastman, Mortimer Fleishhacker, F. J. Koster, J. B. Levison, F. L. Lipman, H. Clay Miller, President of the San Francisco Chamber of Commerce; Judge M. C. Sloss, James B. Smith, Mrs. Sigmund Stern and Supreme Justice William H. Waste.

Formal invitations to enter into the permanent organization of the foundation were drawn up by the sponsors of the plan and forwarded to forty-six other persons of wealth in California. These were announced to-day as follows:

William Randolph Hearst, Wallace M. Alexander, Robert I. Bentley, F. W. Bradley, W. I. Brobeck, George F. Cameron, Wigginton E. Creed, A. B. C. Dohrmann, R. Stanley Dollar, John S. Drum, Sidney M. Ehrman, Milton H. Esberg, Edward L. Eyre, Herbert Fleishhacker, Mrs. James L. Flood, Mark L. Gerstle, A. P. Giannini, J. D. Grant, Moses A. Gunst, Charles W. Hass, E. B. Hale, C. S. Howard, Kenneth R. Kingsbury, Mrs. M. S. Koshland, William A. Magee, Walter S. Martin, Atholl McBean, Garrett W. McEnerney, Charles K. McIntosh, James K. Moffitt, Walton N. Moore, John Francis Neylan, Warren Olney,

Mortimer Fleishhacker, Frederick J. Koster, J. B. Levison, F. L. Lipman, H. Clay Miller, M. C. Sloss, James B. Smith, Justice William H. Waste; and one woman—Mrs. Sigmund Stern.

As sometimes happens with newspapers, despite the best intentions of editors, the New York WORLD was somewhat premature in stating that the foundation *had been formed*. What it should have stated was that this group had met, elected Charles W. Merrill Chairman, and *resolved* to establish such a foundation, after learning how best to do so by studying other organizations with a similar objective. That was as far as this group went at its initial meeting—as far as it *could* go.

That the praiseworthy idea of establishing an institution with such a noble objective should have occurred to these people is significant. It is significant because it points up the fallacy of the too-widely held belief that all rich men are cold and calculating, and think only of *getting* money. It is significant also because all of these persons were at the time the moving spirits of the Community Chest of San Francisco, and thus were dealing intimately with problems which well-directed philanthropy could help to solve. At the time, Charles Merrill, as Chairman of the Executive Committee of the San Francisco Community Chest, was earnestly and actively engaged in helping it "build a bridge for humanity." It would be presumptuous to contend that the conception of The San Francisco Foundation was his alone. However, it may properly be said that he had made the idea his own by embracing it fervently, and that it was he who inspired the calling of this meeting for this special purpose.

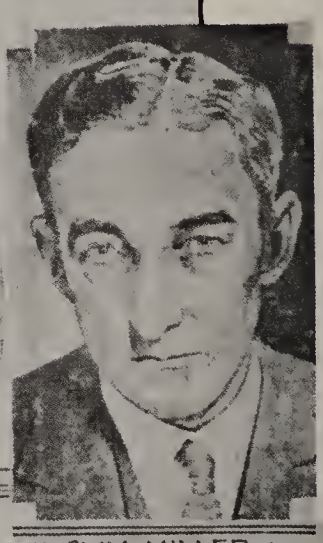
Anyone who ever had any real contact with Charlie Merrill will realize that he knew such an idea could not materialize overnight. But he also knew that the way to get something started is to act, not just talk about it; so he joined in the call for the original meeting, and thereafter, as Chairman, called many other meetings.

About four weeks after the meeting of July 12th, the New York WORLD published another article with a San Francisco dateline (August 7, 1926); this time a much longer one, about the San Francisco Foundation. This article was accompanied by photographs of Merrill, Crocker, Coldwell, Lipman, Campbell, Chamberlain, Koster, Miller, Fleishhacker,

CHARLES W. MERRILL

SELAH CHAMBERLAIN

F. J. KOSTER



H CLAY MILLER

James D. Phelan, James Rolph jr. Mayor of San Francisco, Abraham Rosenberg, W. P. Roth, Albert E. Schwabacher, Paul Shoup, Mrs. A. [illegible] Spreckels, Oscar Sutro, E. J. Tobin, George Tourny, James Tyson, Lyman Wilbur, President of Leland Stanford Jr. University.

This group, it was pointed out, Andrew F. Welch and Dr. Ray represents the "cream of wealth in San Francisco" and embraces men and women of every branch of business, professional, industrial, scientific, educational and commercial life.

Merrill, Crocker, Mortimer Fleishhacker, Miller and Sutro issued the original call to consider the foundation plan.

Subsequent to the initial luncheon it was announced that Merrill had been named temporary chairman of the organization and had been empowered to name a committee to investigate and report on the details of the formation of the permanent or-

Smith, and Justice Waste; and in it Merrill, in outlining the plan, pointed out that the organization was intended to accept and administer small as well as large bequests. The foundation would, he said, provide "*working machinery, without cost, for the man who may wish to leave a very small sum as a bequest to some institution or cause. It is thus that the community foundation becomes, in the truer sense of the word, a democratic institution—a 'people's foundation'.*"
At the time of making this statement Merrill announced that within the month he would appoint a committee to study other foundations.

Space limitations preclude a full account of all that transpired after this. All concerned were ardently and enduringly in favour of the project. But all concerned were also exceedingly busy men of large affairs and heavy responsibilities; hence cramped for time. Moreover, in the nature of things, an organization such as the one contemplated could not be effectuated in haste. Time—much time—was required solely to study thoroughly the mechanics, methods and results of other foundations with a like objective. Here was something intended to endure for the ages; therefore it should be —it MUST be—done and begun right.

In due course Charles Merrill appointed a committee to study other foundations, and this committee began its work. However, there were unavoidable interferences and delays; and before Merrill and his associates were ready actually to launch the foundation, the Great Depression struck. That, of course, put an insurmountable obstacle in the path of further progress for the time. Before the Depression was over, World War II intervened, and by the time the latter had ended some of the persons in the Merrill group of foundation-sponsors had died, and others were incapacitated by age, health or other conditions.

Thus, the original project died. But not the idea. Late in 1946, a group of mainly younger San Francisco men and women—prototypes, one might say, of the original group—formed an Exploratory Committee to see if this idea could be transformed into reality. The members of that committee were: James B. Black, Charles R. Blyth, Gardner Bullis, W. W. Crocker, Charles deY. Elkus, Sr., Mrs. Charles deY. Elkus, Jr., W. P. Fuller, Jr., Mrs. Leslie W. Ganyard, Mrs. Frank Gerbode, A. Crawford

MORTIMER FLEISHHACKER ◇ Judge WILLIAM H. WASTE ◇

◇ JAMES B. SMITH ◇

ganization at the second meeting in October.

This committee, it was announced, will make a complete study of the plan of organization of the Rockefeller Foundation, the Russell Sage Foundation and community foundations [redacted] been formed in fifty-one other American cities.

The original community foundation plan as fostered by F. H. Goff of Cleveland, now deceased, it was stated, would form the basis of organization. Goff was praised at the "trail-blazer" in the foundation scheme now followed by so many American cities.

Declaring that San Francisco citizens are bequeathing in excess of $1,000,000 a year, and that proper distribution and utilization of this great sum is essential, the fourteen original sponsors of the local movement expressed themselves as of the opinion that the bequests represent a community problem.

Chairman Merrill, outlining the position of his group, declared today:

"The plan is rather simple, and n t far removed, or much different, from the organization of the Rockefeller Foundation. Its principal novelty is that it provides working machinery, without cost, for the man who may wish to leave a very small sum as a bequest to some institution or cause. It is thus that the community foundation becomes in the truer sense of the word a democratic institution, or a "people's foundation."

"The trustees who manage the foundation would serve without remuneration and would be self-perpetuating. They would look after the funds intrusted to their care; they would ask those who leave bequests not to bind them to specific instructions, but to give them a general outline of their purpose; they would follow specific instructions to the letter as long as common sense would dictate such a course, but if conditions should change the terms of the will would leave them free to use their judgment in attempting to approximate the purpose of the donor of the legacy.

"The community foundation would be a fund created by the union of many gifts, many different estates or parts of estates held in trust, contributed by the people of San Francisco and managed by them for the benefit of the City of San Francisco. The foundation would provide an income for promoting education and scientific research; for the improvement of living conditions; for providing facilities for recreation; for assisting educational and charitable institutions; for many other purposes which would make for the mental, moral or physical improvement of the people of San Francisco.

Merrill pointed out that in the selection of the leaders chosen for membership in the foundation the attempt had been made to obtain persons with widespread knowledge and interest in every phase of public life. In this way, it was believed, it would be possible to establish the organization on such a basis as to give "fair play" to every institution or cause that might be involved.

Merrill announced this week he would name his committee on investigation of other foundation plans some time during the present month, from which time on the plans will be formulated rapidly.

Greene, Hyman Kaplan, Daniel E. Koshland, Beverly Letcher, Samuel Lilienthal, James K. Lochead, J. W. Mailliard, Jr., Harold R. McKinnon, C. O. G. Miller, Mrs. Ryer Nixon, T. S. Petersen, Herman Phleger, Mrs. William P. Roth, Harold E. Winey, Dean Witter and Jean Witter.

The Exploratory Committee was successful. Less than two years later—in January, 1948—The San Francisco Foundation was established. It is today a healthy, growing institution; growing in strength and in service to the Community. As of its 8th year, its Annual Report, covering the period July 1, 1955, to June 30, 1956, showed it to have made grants during the fiscal year of more than $260,000.00, and that its assets had grown to nearly $1,000,000.00. At that time its Distribution Committee—which "is in most ways the governing board of the Foundation"—consisted of Mrs. Henry Potter Russell, Chairman; Daniel E. Koshland, Vice-Chairman; T. S. Petersen, Treasurer, and Mrs. Willard H. Durham, W. P. Fuller, Jr., Farnham P. Griffiths, Mrs. Alfred McLaughlin, and Eugene M. Prince. On its Advisory Committee were Milton Chernin, Mrs. Charles deYoung Elkus, Jr., J. Paul Leonard, Charles E. Smith, M.D., and Lynn T. White, Jr. Its Trustees' Committee numbered bankers Ralph C. Whitsett, Jr., David L. Anderson, David J. Barry, Bradley B. Brown, C. E. DeRochie, E. T. Hannon, D. W. Holgate, J. Boatner Chamberlain, H. G. King and Laurence H. Tharp. Its counsel was Lawrence C. Baker, and its Executive Director was John R. May.

Perhaps it would be too much to say that this splendid San Francisco institution, with its noble objective, was established upon the foundations laid by the Merrill Group named at the beginning of this chapter. However, it may be said with warrant that this Group prepared the ground and sowed the seed for what Charles W. Merrill so aptly termed a "people's foundation," dedicated to the highest ideals of service to the entire community.

POOL BIG BEQUESTS TO AID COMMUNITY

14 Rich San Franciscans of $100,000,000 Fortunes Form Estates' Foundation

BOARD TO GET LEGACIES

Will Handle Charitable, Scientific and Educational Funds

SAN FRANCISCO, July 12 (A. P.)—Fourteen of San Francisco's wealthiest men, representing fortunes in excess of $100,000,000, to-day formed a community foundation under which millions of the surplus wealth of the richer families will be donated to the future benefit of the community as a whole.

Under plans advanced, each member will make specific gifts for charitable, scientific and educational purposes, and a self-perpetuating board of trustees will be formed to handle bequests after a donor's death.

Charles W. Merrill was appointed Chairman with instructions to name a committee authorized to study the Rockefeller and Russell Sage Foundations and all other leading community funds in American cities. Organization details will be perfected at a meeting in October.

The call for to-day's meeting was issued by Mr. Merrill, William H. Crocker, banker and Republican National Committeeman from California; Mortimer Fleischacker, banker and member of the Board of Regents of the University of California; Paul Shoup, railroad executive and member of the Board of Trustees of Stanford University, and Clay Miller, merchant and former president of the Chamber of Commerce here.

The idea came from the Community Foundation of Cleveland, devised by the late F. H. Goff of that city.

Chapter 26

"FOR DISTINGUISHED ACHIEVEMENT"

ALTHOUGH generally this record of the life and work of Charles Washington Merrill has sought to be consistent with chronology, it has appeared advisable for various reasons to present certain events or incidents out of their time sequence. In particular, this has seemed desirable with respect to the account of one of the most distinguished of the many preferments and honors which came to him at various times in his life.

A writer in a recent magazine article has remarked the paradoxical fact that in the last decade or two America, "a nation which has no titles of preferment, has seen the rise of numerous organizations whose only reason of being appears to be to confer 'honors' and 'awards' quite indiscriminatingly." The author goes on to wonder whether this is "a genuine rebellion against the levelling processes of democracy," or "merely the efforts of high-powered publicity agents to make unimportant people seem important." He is inclined to believe it is a little of both, with the emphasis on the latter.

However that may be, it is unnecessary to state, except as emphasis, that the honors received by Charles W. Merrill were infinitely removed from the brummagem "awards" of the synthetic societies of which the above author speaks. Merrill's came in every instance from old-established organizations of the highest standing and of well-earned renown. They were of pure gold, without alloy, and were given in recognition of *genuine* achievement.

One of the most important and noteworthy of these was the JAMES DOUGLAS MEDAL, which was awarded to Merrill by the American Institute of Mining and Metallurgical Engineers in 1924.

The Institute above-named is perhaps the most famous organization of its kind in the world. The endowment for the James Douglas Medal was established by anonymous donors in 1922. Its purpose is to commemorate the life and work of the late Dr. James Douglas, one of the best-loved mining engineers, a distinguished metallurgist who was twice President of the Institute.

The provisions of the Endowment require that the gold Medal is to be awarded once a year "for distinguished achievement in non-ferrous metallurgy," and without limitation as to nationality or membership in the Institute.

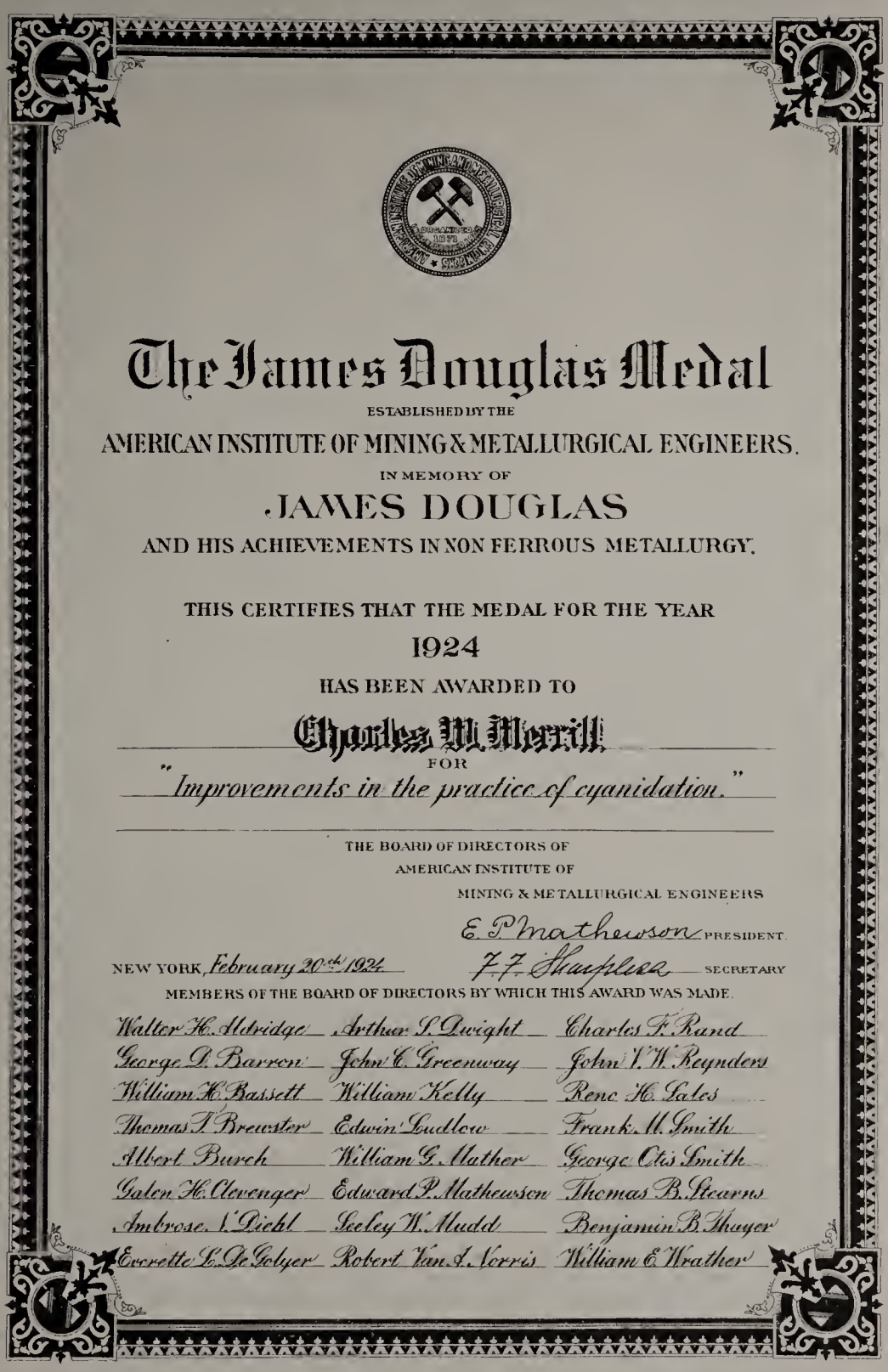
The choice of the recipient is based upon the report of a committee of fifteen members who are interested in non-ferrous metallurgy.

The first Medal was awarded in 1923, and the first recipient was Frederick Laist, distinguished for "Research and Achievement in the Metallurgy of Copper and the Electrolytic Production of Zinc," who was for years with The Anaconda Copper Company.

Thus Charles Merrill was the second of the James Douglas medalists; and it is interesting to note that his only predecessor in receiving this honor was also a graduate of the University of California's College of Mines.

The members of the committee which selected Charles Merrill as the recipient of the Medal for 1924 were Charles F. Rand, Chairman, and Benjamin B. Thayer, H. H. Alexander, Walter R. Ingalls, George C. Stone, E. P. Mathewson, Frank M. Smith, Arthur L. Walker, Arthur S. Dwight, David Cole, Charles W. Goodale, Walter Douglas and James C. Roberts—all metallurgical engineers of world-wide renown.

The award was made to Merrill for distinguished achievement in improvements in the Practice of Cyanidation, and was based upon his pioneering work and outstanding accomplishments at The Homestake Mine. In making the award, at a banquet of the Institute held in New York at the Hotel Waldorf-Astoria, February 20, 1924, the Chairman of the Medal Committee for 1924 said, in part:



The James Douglas Medal

ESTABLISHED BY THE

AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS.

IN MEMORY OF

JAMES DOUGLAS

AND HIS ACHIEVEMENTS IN NON FERROUS METALLURGY.

THIS CERTIFIES THAT THE MEDAL FOR THE YEAR

1924

HAS BEEN AWARDED TO

Charles W. Merrill

FOR

"Improvements in the practice of cyanidation."

THE BOARD OF DIRECTORS OF
AMERICAN INSTITUTE OF
MINING & METALLURGICAL ENGINEERS

E. P. Mathewson PRESIDENT.

NEW YORK, February 20th 1924 F. F. Shepherd SECRETARY

MEMBERS OF THE BOARD OF DIRECTORS BY WHICH THIS AWARD WAS MADE.

Walter H. Aldridge	Arthur S. Dwight	Charles F. Rand
George D. Barron	John C. Greenway	John V. W. Reynders
William H. Bassett	William Kelly	Rene H. Sales
Thomas T. Brewster	Edwin Ludlow	Frank M. Smith
Albert Burch	William G. Mather	George Otis Smith
Galen H. Clevenger	Edward P. Mathewson	Thomas B. Stearns
Ambrose V. Diehl	Seeley W. Mudd	Benjamin B. Thayer
Everette L. DeGolyer	Robert Van A. Norris	William E. Wrather

The coveted James Douglas Gold Medal was awarded by American Institute of Mining and Metallurgical Engineers in 1924 to Charles W. Merrill for distinguished achievement in non-ferrous metallurgy.

THE JAMES DOUGLAS MEDAL

"It was at the Homestake Mine that the first opportunity of importance presented itself to Mr. Merrill; 3,000 tons of tailings containing an appreciable amount of gold were being flushed out of the mill every day. As the result of his private experimental work several plants were built, which treated these and other tailings at a very substantial profit.

"From that time forward until today one improvement after another in cyanide practice has resulted from Mr. Merrill's unceasing experimental work toward increasing recovery and decreasing expense.

"The Merrill methods of treatment, precipitation and filtration are in use throughout the world. Through his efforts, waste tailings and lean gold-bearing rock have become commercial ore. Operators and engineers owe him a debt of gratitude for making it possible to convert material loss into substantial profit, while the world at large is richer by many millions of gold through his wisdom and skill.

"Mr. President, as Chairman of the Medal Committee and by its unanimous voice and by unanimous vote of the Board of Directors of the Institute, I have the honor of presenting to you for the award of the James Douglas Gold Medal, MR. CHARLES WASHINGTON MERRILL." . . . . . .

"All human progress," said Goethe in one of his conversations with Eckermann, "comes through individual man. Man in the mass fills up armies and fights wars; he tills the soil, he garners the harvest, and does a hundred other things that are useful. He is necessary. But the world advances—in the realm of spirit as well as matter—only through the vision and the creative accomplishments of individual man."

That dictum of the great German philosopher, poet and scientist is reaffirmed in the closing words of Chairman Rand's tribute to Charles Washington Merrill—"Operators and engineers owe him a debt of gratitude for making it possible to convert material loss into substantial profit, while the world at large is richer by many millions of gold through his wisdom and skill."

Chapter 27

HONORS AND OBLIGATIONS

UNDER DATE OF April 11, 1922, Frank H. Probert, Dean of the College of Mining of the University of California, wrote to Charles W. Merrill as follows:

> "Provision has been made by action of the Graduate Council and the Academic Senate whereby the Engineering Colleges of the University of California can recognize their distinguished alumni by conferring upon them the Engineer's degree. It seems very proper, both because of your eminence in the metallurgical world and your continued expressions of love and loyalty to California, that you should be the first one to be invited . . . for the degree of Metallurgical Engineer."

Because of his world-wide eminence in his profession, and because he had already written and published numerous metallurgical treatises, Merrill was not required to write a thesis for the occasion, and the degree of Metallurgical Engineer—the first to be awarded by the University of California—was conferred upon him with appropriate ceremony during the Commencement Week of May, 1922.

When Dean Probert, in his letter of invitation, spoke of the "love and loyalty" that Merrill had displayed for his Alma Mater, the Dean was not indulging in mere mellifluous phrasemaking. Numberless times since his graduation, Charles Merrill had publicly lauded the University and acknowledged the debt of gratitude he felt toward it for "providing me

with the education which has enabled me to accomplish what I have in my field." Wherever he believed his influence might be felt, he had raised his voice in behalf of ideas and measures calculated to promote the well-being of his Alma Mater, in particular, advocating much-needed new buildings and facilities, and better salaries for the faculty. And on frequent occasions he had signified to the University authorities his eagerness to serve in any way he could.

All of this was before April, 1922; but, quite naturally, the action of Dean Probert in inviting him to be the first recipient of the University's degree of Metallurgical Engineer, intensified his desire to prove his gratitude.

Thus when, in 1924, the Alumni Association of the University of California called upon him to accept the office (and service) of its presidency, he consented.

This was at a time in his career when professional commitments had become more than ever numerous, and when world demand for installation of his metallurgical processes, methods and equipment was growing rapidly. However, Merrill accepted this new assignment gladly, even though he knew it meant a great deal of work in itself—besides carrying with it the added responsibilities of serving as a Member of the Board of Regents—and at once took up its duties with vigor and enthusiasm.

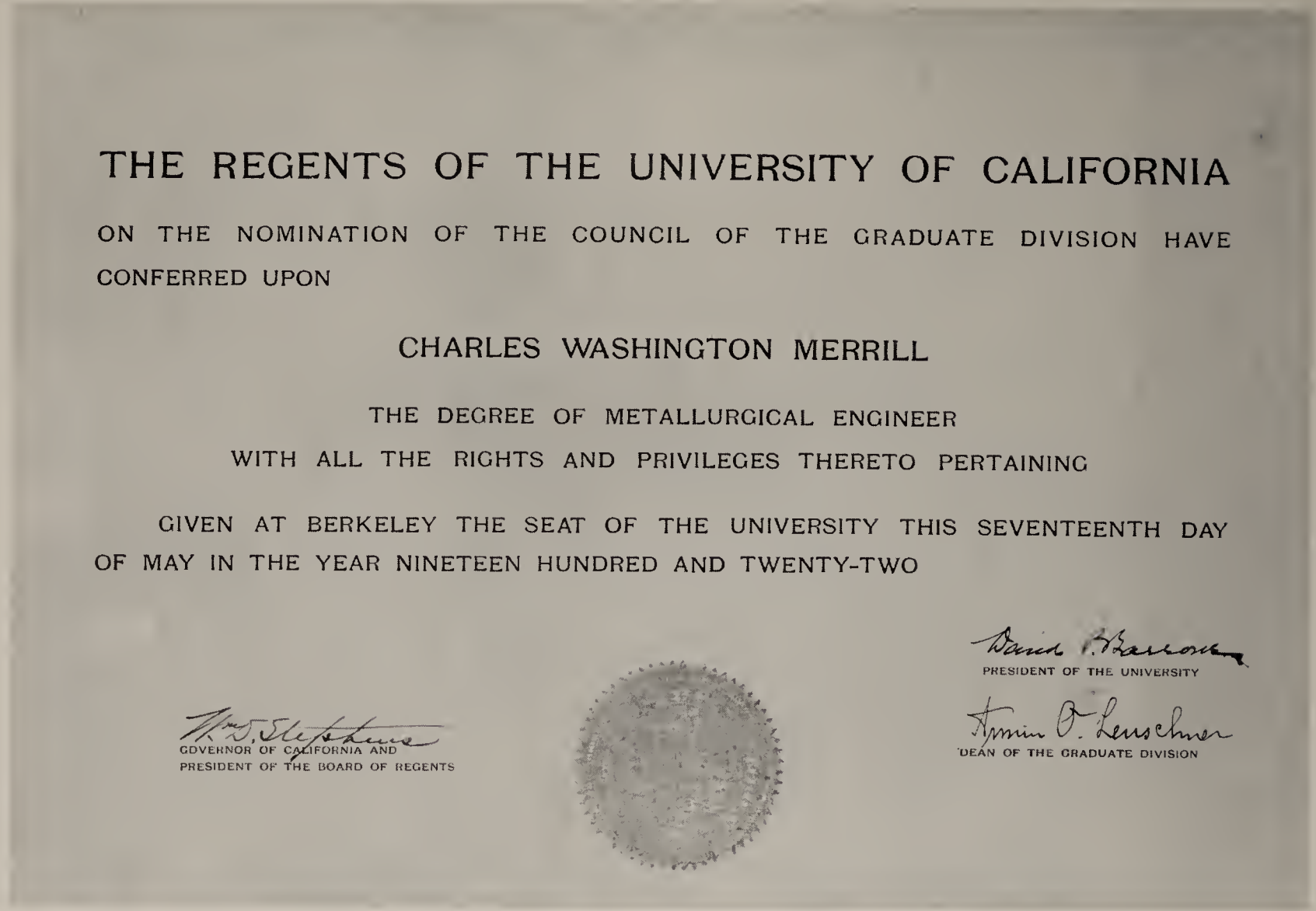
In its editorial announcement of Merrill's election *The California Monthly* of September, 1924, said:

> "Mr. Merrill is a man of distinguished achievements. He ranks high among mining engineers . . . His general interest in the University has been uninterrupted; he has a renewed personal interest in the institution through the fact that his older son, Jack Merrill, 24, has just been graduated, and that his younger son is about to enter. He brings to his new office an intimate knowledge of alumni and university problems, having been for four years first vice president of the Association. As President, he is a Member of the Board of Regents. The Alumni are fortunate in their new leader."

As a matter of fact, Merrill—as first vice president—had already been working on what he regarded as one of the most important problems—that of securing more members for the Association. In his "Message to Californians," after thanking the Alumni Association for selecting him as President, he directed his first attention to this. He said:

> "The most effective instrument that exists with which to conquer many of the great problems facing our University, and to insure its proper progress, is unquestionably the total body of the alumni, and splendid progress has been made during the past year in enlarging its organized membership to eleven thousand. Nevertheless, there remain nearly thirty thousand without the fold, yet to be enlisted in our ranks. Now we know that to prevent, for instance, a repetition of the momentous setback which our University suffered through defeat of the tax amendment for its adequate financing, we must carry the message to and utilize the services of as many of that thirty thousand now unorganized as is humanly possible. Therefore, we shall again in due course ask all the members to renew their efforts in this great and worthy task."
>
> "Only by success in this work," he continued, "can we make our influence sufficiently wide and potent to meet this and the other vital problems which hamper the full development of our beloved Alma Mater, and we shall call this effort the first plank in our platform of endeavor."

He then went on to outline the other "planks" for which he would strive—to insure true democracy through a plan for district representatives so that every fifty members would select a representative to a general conference which would, in turn, elect a committee to nominate the President and all other officers of the Association; to "bring to the graduates in their home environment that quickening of interest and broadening of vision which comes from continued touch with the thought and events of their Alma Mater"; to make the recently inaugurated "homecoming" of graduates to the campus a yearly affair, and to expand the Alumni monthly magazine in order to make it a more effective means of



THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

ON THE NOMINATION OF THE COUNCIL OF THE GRADUATE DIVISION HAVE CONFERRED UPON

CHARLES WASHINGTON MERRILL

THE DEGREE OF METALLURGICAL ENGINEER

WITH ALL THE RIGHTS AND PRIVILEGES THERETO PERTAINING

GIVEN AT BERKELEY THE SEAT OF THE UNIVERSITY THIS SEVENTEENTH DAY OF MAY IN THE YEAR NINETEEN HUNDRED AND TWENTY-TWO

GOVERNOR OF CALIFORNIA AND
PRESIDENT OF THE BOARD OF REGENTS

PRESIDENT OF THE UNIVERSITY

DEAN OF THE GRADUATE DIVISION

Degree of Metallurgical Engineer awarded to Charles W. Merrill by the University of California—May 17, 1922.

informing the alumni of significant developments within the University. Finally, he pledged "a definite programme of accomplishment," and said that "the only embarrassment in this connection is not to find enough to include, but to select the most urgent of the many constructive issues which face us."

"The Alumni are fortunate in their new leader."

So read the concluding sentence of the *California Monthly's* announcement of Merrill's election as President of the Alumni Association, and events were to prove that sentence prophetic. Despite the other increasing demands upon his time and energy, he devoted himself unsparingly and with never-ending enthusiasm and imagination to the stream of activities and problems accruing of the position.

This is not the place to present the full record of Charles Merrill's accomplishments as President of the Alumni Association of the University of California. It may and should be stated, however, that here again, having put his hand to the plow, he went through to the end of the furrow. During the two years in which he served as its President, the Alumni Association more than doubled its membership! Specifically, the increase was from about 11,000 in 1924, to more than 25,000 in 1926, at the end of his term.

Nor was it by numbers of new members alone that Merrill's success could be measured. Not only did he carry out all the other "planks" in his "platform of endeavor," but it is the testimony of all concerned that, by communicating his ardor and devotion to his associates, as well as to the membership rank and file, he vastly augmented the influence and thus the effectiveness of the Alumni Association in advancing the welfare and progress of the University.

Charles Merrill held that honors and preferments always carried with them inescapable responsibilities and duties on the part of their recipients. Therefore, he believed that his service to the University of California—as President of its Alumni Association, and as a Member of the Board of Regents—was no more than living up to his responsibility and fulfilling his duty to an institution which had done much for him.

Fortunate, indeed, was this institution in finding among its sons such a leader!

Chapter 28

BREAD UPON THE WATERS

SAVE FOR THE closing two or three years, the long life of Charles Washington Merrill—from the time he graduated from college in 1891 until he began to "taper off" in 1953—was one of unceasing activity. (Someone has said of him that he had the energy of two men and used the energy of three.) It is a bit difficult, therefore, to select any particular period in his career and assert of it that this was the busiest of all. However, perhaps it might not transgress exactitude to state that, in some respects at least, the decade and a half beginning about 1920 and ending about 1935 or 1936, falls into that category.

To be sure, he may well have worked longer hours per day, and under greater pressure, during those strenuous years he put in at The Homestake. But from 1920 to 1935-1936, his activities were far more numerous, diverse and ramifying.

It was during this period that, besides carrying on the expanding work incident to his profession and his business, he served the University of California for two busy and fruitful years as President of its Alumni Association and a Member of its Board of Regents, and the Community of San Francisco for a like time as Chairman of the Executive Committee of its Community Chest.

It was also during this period that he and his staff in The Merrill Company, and its subsidiaries, developed and propelled to world-wide success the appliance which his old associate and friend, Lou Mills, uncovered in Mexico—the Merco Nordstrom Valve. Likewise, it was within

this same decade and a half that he and his associates improved a number of his original processes and methods—giving them greater efficiency and wider applicability; and developed and perfected new metallurgical processes, methods and equipment which went into wide usage.

Thus, by the time this period closed, there was hardly an important gold or silver mining operation in the entire world—Canada, Mexico, Central and South America, South Africa, India, China, Japan, the Philippines, Malaya and Australia, to say nothing of the U. S. A.—which did not have a Merrill installation of one kind or another.

In short, between 1920 and 1936—especially during the second half of this period—The Merrill Company pushed out increasingly from its hub in San Francisco to virtually every inhabited region of the globe—to become a world institution, doing a world-wide business.

Now, doing a world-wide business has its compensations, but it also has its penalties. It may mean, for instance, paying world-wide taxes of various kinds; and one day in the middle 'thirties it occurred to Herbert Shuey, as Company Treasurer, that they might owe income taxes in many countries where they had sold patent rights, machinery, equipment, etc., to various mining companies.

Shuey discussed this matter with President Merrill, who agreed that it required looking into at once. Consequently, requests were sent to the proper officials of all the countries in which they had been doing business for copies of their income tax laws.

In due course these arrived, and examination of them made it abundantly apparent that The Merrill Company and/or its subsidiaries owed income taxes in Japan, the Philippines, Malaya, the Fiji Islands, Australia and several individual Australian States. It seemed unwise to attempt to handle the matter by correspondence, since it would involve long delays, and since, in some of the countries, the taxes had been owing for quite a time and might, therefore, carry interest and heavy penalties. Hence it was decided that Treasurer Shuey, armed with a substantial letter of credit, should visit all these countries, see the income tax officials and endeavor to make settlement then and there.

Accordingly, early in 1937, Shuey took ship for the Far East. His

first stops were in Japan, the Philippines and Malaya; and there, save for the traditional Oriental slow way of transacting business, he had no difficulty in making satisfactory settlements with the tax officials.

From Singapore he sailed for Sydney, Australia. Aboard ship, he again scrutinized the various Australian income tax laws—State and Federal—and came to the conclusion that The Merrill Company undoubtedly owed taxes in the State of Queensland, whose port—Brisbane—was his ship's first scheduled stop.

The question then posed itself to him—should he leave the ship at Brisbane and call on the State Income Tax Commissioner there, or—since there were possible heavy penalties involved—go first to Melbourne and discuss the whole matter with The Merrill Company's Agents and the latter's attorneys before seeing any of the tax officials? The question was not easy to answer; and so, having made the acquaintance of several prominent Australian businessmen who were on his ship returning from a Singapore holiday, he put it to them. Their unanimous and unqualified answer was that he should go first to Melbourne and consult with the attorneys. In the end, however, Herbert Shuey did what Johannes Brahms is said to have done when he was composing his famous violin concerto—listened attentively to the advice of all the experts and then followed his best judgment.

Leaving the ship at Brisbane, Shuey went at once to the State Income Tax Commissioner and told him why he was there.

After listening for a few minutes with mounting surprise, bordering on incredulity, the Commissioner broke in to ask: "Do you mean to tell me, Sir, that you would come all the way from America to Brisbane—voluntarily—to pay a tax obligation you did not know about until recently?"

Upon being assured that this was precisely the case, he said: "I must tell you, Sir, that this is the first time any such thing has ever happened in all my years of experience, and I still can hardly believe my ears."

The Commissioner then went on to say that such unusual conduct on the part of a taxpayer certainly deserved fitting recompense, and, after explaining that the law gave him discretionary power in these matters,

announced that he would waive all interest and penalties and tax the Company at the lowest possible rate!

This he did. And The Merrill Company, through having laid all its cards on the table, was able to settle for approximately 100 pounds a tax claim that, including interest and penalties, could have been enforced for *several thousand pounds!*

This experience was sufficient to convince Herbert Shuey that he was on the right track; wherefore, he proceeded to go from State to State in Australia—wherever he believed taxes were owing—and finally to the Federal Government at Canberra. In each instance he did just what he had done in Brisbane—told his story frankly to the Income Tax Commissioner; and in each instance received the same friendly and generous treatment he had received in Brisbane, and thus succeeded in making a very favorable settlement in every case.

In the course of his reminiscences concerning this matter, Charles Merrill remarked to the writer: "Well, this certainly was one time when both those old adages—'Honesty is the best policy' and 'Cast your bread upon the waters'—proved out perfectly in practice. You know, when Herbert Shuey left, I had put the whole thing in his hands—given him *carte blanche* to handle it according to his best judgment. But goodness knows I never expected it would be possible for him to make the fine settlements he did. As it turned out, he and his wife had a wonderful trip, and saved our Company many thousands of dollars."

* * *

Perhaps it may be contended that the connection is far-fetched; nevertheless, one is tempted to suggest that the foregoing incident—besides validating the axioms to which Charles Merrill referred—rather conclusively refutes some of the favorite arguments of those who condemn the free enterprise system.

Chapter 29

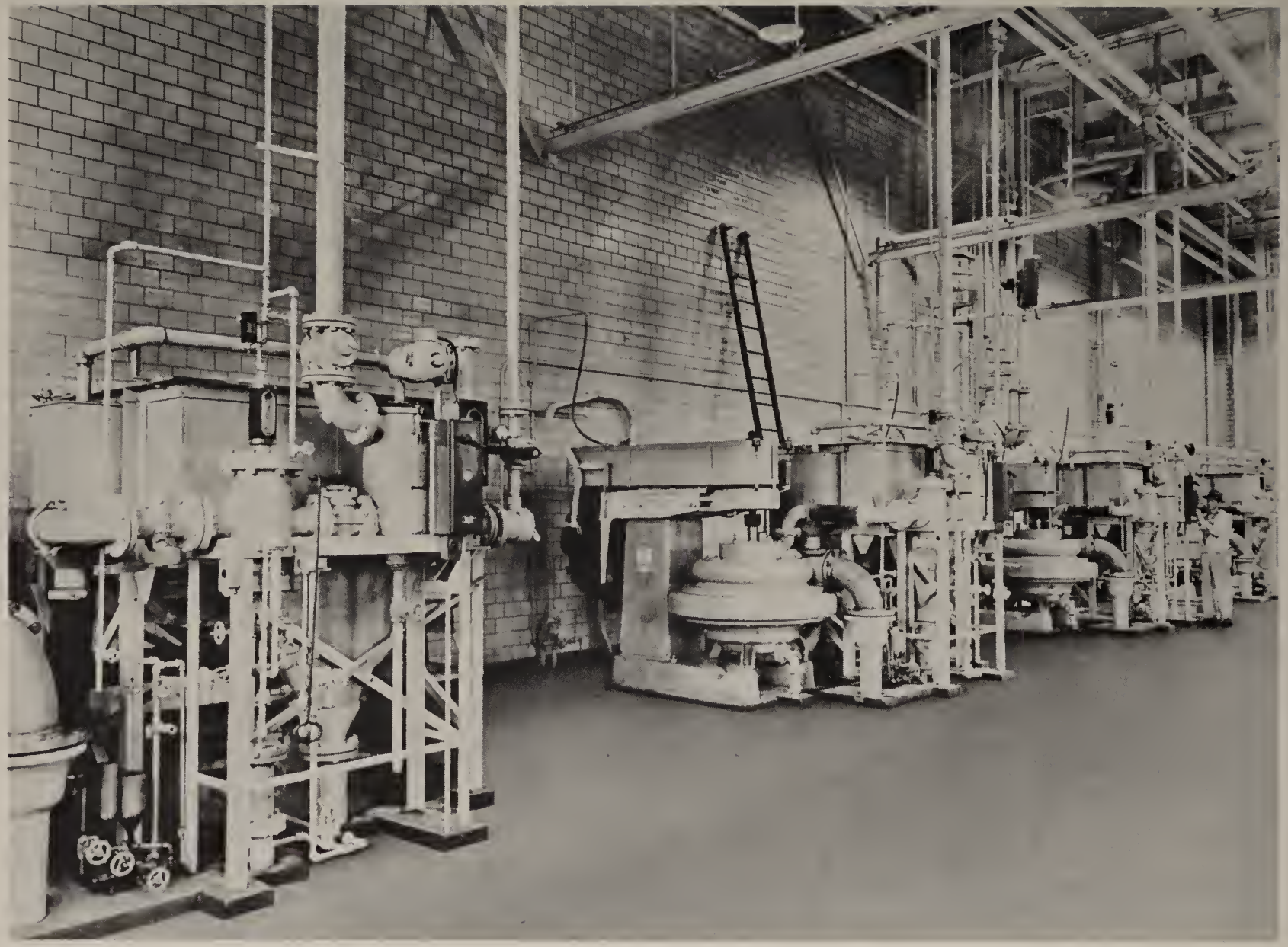
MORE PIONEERING

HAVING BUILT up a highly capable and diversified engineering and technical organization, Charles Merrill and his associates were continually on the alert for new inventions, new ideas, new mechanisms or processes—in short, new problems to solve in the whole broad field of engineering and technology. Given a mechanism or a process that was sound in principle but in a more or less unproven or undeveloped stage, they had the facilities—technical and financial—to develop and perfect it, and then to market it on a national or even worldwide basis.

One example of this was the Nordstrom Valve, earlier described, which, under their capable handling, became a resounding success, incidentally making its inventor—Sven Nordstrom—a millionaire.

Another example is the subject of this chapter—the Merco Centrifugal (or Centrifuge)—a mechanism which grew out of the approximately similar inventions of two men, one in San Francisco and the other in St. Louis, and which was perfected, developed and marketed by Charles W. Merrill and his associates after ten years of extremely difficult and exceedingly costly endeavor.

The beginning of this story, insofar as The Merrill Company is concerned, goes back to the year 1928, when a mechanical engineer named Harrison S. Coe came to Louis D. Mills and told him he had invented a machine which, through the application of centrifugal force, would continuously separate sand from slime. As Coe's claim, if it was borne out,



Merco Centrifugals operating in a large starch plant. This mechanism, developed and perfected by The Merco Centrifugal Company, has revolutionized starch making throughout the world.

would provide a tremendous improvement over the inefficient gravitational and washing methods then in use for this purpose, Mills listened with mounting interest and, when Coe had concluded, asked him for a demonstration.

Harrison Coe was what is often termed "a typical inventor"—by which is meant a man with a patentable idea or device, but without the financial resources with which to perfect and develop it. Because of his lack of money, he had been obliged to build his machine himself. This he had done, out of makeshift materials, in the garage at his home. Mills accompanied him there for a demonstration and, at first sight of the crudely built contraption, was somewhat shocked and disappointed. However, without any ado, Coe got some oil well drilling mud, put it into the machine, switched on the electric current, and—to Mills' astonishment and delight—it worked!

Mills was enthusiastic. He brought Coe back to The Merrill Company offices and introduced him to Charles Merrill. The latter, after listening to Mills' account of what he had just witnessed, and to Coe's detailed explanation, expressed great interest and indicated a willingness to consider taking over and developing the Coe machine, provided that there were no insurmountable patent obstacles in the way. The first thing to do, he said, was to ascertain how Coe stood, patentwise; and he suggested that Mills, before doing anything else, prosecute an inquiry through the U. S. Patent Office.

Now the scene shifts from San Francisco to the Middle West. The inquiry which Mills instituted concerning Coe's machine revealed that there was patent interference. There was the possibility of such by an old established manufacturer of centrifuges, and there was the certainty of it from another mechanical engineer, a man named Albert Peltzer of St. Louis. The latter, it developed, had been working on the problem of cornstarch separation for years, had devised and patented a mechanism similar in principle to Coe's, and had been striving to introduce it into the cornstarch manufacturing industry, where the separating methods in use were by present standards clumsy, costly and wasteful. Meeting with no success there, he had sought to interest one of the country's oldest and

largest centrifugal companies, but they—having spent a vast amount of money in a futile effort of their own to perfect such a machine—also turned a deaf ear.

All this Mills learned and reported to Merrill. There followed many discussions of the matter, and finally it was decided that Mills should go East and talk with Peltzer—to see if there was a possibility of combining the Coe and Peltzer inventions, and, if so, to make Peltzer a proposition.

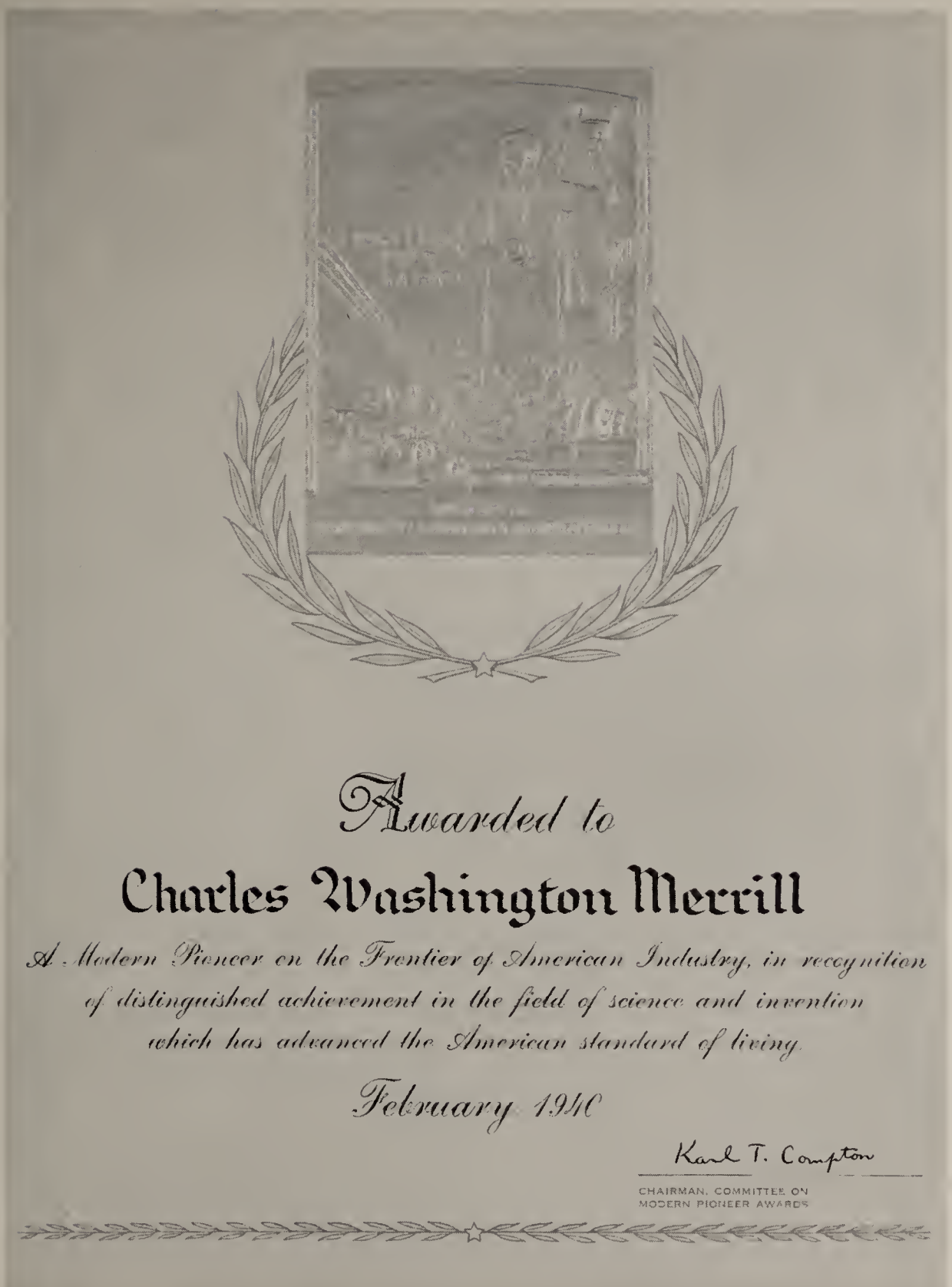
Mills met Peltzer in Chicago, and, after a series of conferences, Peltzer accepted the proposition Mills made on behalf of The Merrill Company. The terms of this were, in brief, that The Merrill Company would take over the inventions of Peltzer and Coe, combine them by utilizing the best features of each, and then perfect and exploit the mechanism. To this end The Merrill Company would organize a subsidiary corporation—Merco Centrifugal Co.—whose stock would be owned by The Merrill Company, Coe, and Albert Peltzer and his son, Albert Peltzer, Jr.

When this agreement had been ratified, Merco Centrifugal Co. was organized, and the two Peltzers—father and son—joined forces with Mills and Coe in San Francisco.

The first step was to build a demonstration machine, embodying the combined inventions of Coe and Peltzer. Previously the Peltzers had been working with cornstarch and Coe with mining ores, so their machines differed in some particulars. It was decided to use the best features of each machine as a model to work from. This demonstration machine was built, and although it effected the separation promised for it, it did not prove wholly satisfactory with mining ores because the abrasiveness of the crushed quartz tended to wear out certain parts in the machine.

At this juncture Lou Mills, who was essentially a mining man and appraised anything in terms of its effective application to the mining industry, experienced a loss of interest in the Merco Centrifugal. Not knowing anything about corn processing, the machine's possible application to this industry meant nothing to him. Consequently, responsibility for the further development of the new centrifuge was turned over to another member of The Merrill Company staff—Clarence J. Brown.

Besides the engineering and other technical problems involved in per-


Awarded to
Charles Washington Merrill
A Modern Pioneer on the Frontier of American Industry, in recognition
of distinguished achievement in the field of science and invention
which has advanced the American standard of living
February 1940
Karl T. Compton
CHAIRMAN, COMMITTEE ON
MODERN PIONEER AWARDS

Award to Charles W. Merrill—A Modern Pioneer on the Frontier of American Industry—February, 1940.

fecting the machine itself, Merco Centrifugal Co. was confronted with the financial problem of finding the money necessary to carry on this work.

The cost of financing the development of a successful centrifugal machine through its initial stages was estimated and The Merrill Company agreed to provide this. In speaking of this to the writer, some twenty-five years after the event, Merrill remarked:

> "Had I known in advance what backing this venture was to cost me, the chances are I would have said 'no,' and something which finally turned out to be a very great success might have died aborning."

Here, Merrill was alluding to the fact that financing Merco Centrifugal through its "initial stages" was just a drop in the bucket compared to what its later stages demanded. Several years were required to perfect a centrifugal machine that would function adequately for the purpose intended, and it goes without saying that this was very costly—with "everything going out and nothing coming in." Even after the machine had been developed to the point of demonstrating its capabilities many further difficulties presented themselves.

It was about August, 1932, that Merco Centrifugal had its first demonstration machine ready for field trial; and Albert Peltzer, being intimately familiar with the cornstarch industry, was delegated to demonstrate and test the machine in one of the industry's principal plants.

After several months of work he was discouraged with what appeared to him to be lack of cooperation. Brown, after discussing the matter with his associates, joined Peltzer and found the situation decidedly confused and unsettled. The plant manager was not cooperating. After a day or two, Brown succeeded in bringing these two men together for a long discussion, as the result of which one of the plant engineers made a very thorough test which demonstrated to his satisfaction that the machine operated effectively.

This appeared to have cleared up the situation, as both the plant manager and the testing engineer expressed to Brown their complete satis-

faction with the machine's performance. On the strength of this, Brown then called on an official of the company with a view to selling larger machines to his company. To his profound astonishment this official, although stating that he was aware of the machine's effective performance, manifested a decided lack of interest in it, and indicated that he would not consider purchasing it at anything like the price which had to be charged for it. Unable to budge him from this position, Brown, after politely expressing his disappointment, terminated the interview.

Chapter 30

TROUBLE, TOIL AND TROUBLE

REFLECTING upon the attitude which the official had taken with respect to the Merco Centrifugal machine, Clarence Brown found himself as perturbed and baffled as Peltzer had been earlier. However, one thing seemed certain—there was no use in trying to do any further business with this company now, so why not try one of their competitors. Accordingly, he went to see the president of a rival company whose concern was also an important factor in the cornstarch industry.

He found the head of the rival company not only interested but willing to do business, and contracted with him to build two commercial-sized machines and install them for trial, with the proviso that they would be purchased if they met specified rigid performance tests.

The details of completing this transaction took a week or ten days. Meanwhile, the former official had a change of heart, and, not knowing the whereabouts of Clarence Brown, wired him in San Francisco, requesting that he call again. This message was relayed to Brown, and a day or so later he called on him again. To his surprise this man was now very friendly and professed much interest in the Merco machine. In fact, he asked Brown to install two commercial-size machines—in the regular flow—in one of their smaller plants, on a purchase contract basis similar to the arrangement with the second company. After consulting his head office, Brown agreed to do this, and returned immediately to San Francisco.

In order to keep on friendly terms with chronological sequence, it is now necessary to go back a bit in order to cover an event of major consequence.

It was while these larger Merco machines were in the process of being built that The Merrill Company had an important addition to the firm. This was in the person of John Lisgar Merrill, eldest son of Charles W. Merrill. After graduating from the University of California in 1924, as a mechanical engineer, John Merrill spent three years as a Rhodes Scholar at Oxford University. There, he pursued studies in chemistry and did chemical research in the field of electrochemistry, which led to honors degrees.

On his son's graduation from Oxford, Charles Merrill had invited him to join the firm, but the young man declined because he did not wish to stand under the "family umbrella." Mindful of his father's record, he felt that before accepting this invitation he ought to demonstrate his own capacity—his ability to stand on his own feet and succeed in his own right. Consequently, for several years after leaving Oxford, John Merrill was with the Engineering Department of Blair & Company, of New York. His headquarters were in New York City but he travelled extensively between there and the principal cities of the Middle West, working out financial and technical reorganization problems for large concerns for whom Blair & Company were the bankers. He achieved success in this work; and, liking it, probably would have remained with Blair & Company but for the fact that Charles Merrill and his associates in The Merrill Company continued to urge him to join them. Paying a visit to San Francisco, he learned from his father that the Company had taken on the development of a new type of centrifugal machine, and became so impressed with its great possibilities that he severed his connection with Blair & Company and joined The Merrill Company.

On making this move, John Merrill immediately plunged into the engineering research and developmental phases of the work of perfecting the Merco centrifuge; and, by the time that the machines were ready for demonstration he was devoting himself entirely to this work. Accordingly, when these machines went East, he and the two Peltzers went with them —to superintend their installations and study and check their operations.

These two pilot plant installations—both in the "corn belt"—were the scenes of intensive and ingenious development work throughout the

ensuing two years and a half; and, during this period, John Merrill spent most of his time at one or the other—virtually commuting between them—establishing and superintending engineering research procedures to measure operational results, and assisting in the working out of such improvements in the machines themselves as were required to make them operate with maximum efficiency.

After much of this work had been completed, and the installed machines were operating with demonstrated satisfaction, it was decided that the time had come for Merco Centrifugal to sell the Merco machine throughout the cornstarch manufacturing industry, and Clarence Brown began a tour of the other plants in the Middle West. To them he explained the Merco machine, what it was designed to do, and what it had demonstrated that it could and would do. Officials of all these companies listened attentively and expressed decided interest, but none of them was willing to purchase a machine even on a performance contract basis. Brown was increasingly puzzled at this invariable attitude. Finally he discovered the reason. The president of the last concern on which he called, after listening to his story, asked quite bluntly what Merco Centrifugal Co. intended to do concerning process patents which one of the leading cornstarch companies had applied for covering the Merco process!

Now the mystery was solved. Now Brown knew what had been responsible for the unvarying disinclination to purchase which he had encountered throughout the cornstarch industry. And now he and John Merrill realized that Merco Centrifugal had a new and different kind of battle on its hands.

It was at this juncture that these men also realized how fortunate Merco Centrifugal was in having Charles W. Merrill as its advisor: especially in patent matters. For having had extensive and varied experience in this very expert and technical field, he was alert to all contingencies. Thus, as soon as Merco's pilot machine was perfected, he had applied for process patents covering it. Consequently, as soon as Merco Centrifugal learned of the rival patent application, they moved to have the U. S. Patent Office throw the controversy into what is technically known as "interference." When there are conflicting claims for a patent, this is the

normal procedure to determine which party claimant is entitled to the patent, and involves the holding of hearings at which the rival claimants appear and present their cases.

These proceedings in "interference" went on, in one phase or another, for nearly six years; and during this long period the industry as a whole quite naturally would not consider purchasing Merco machines. Some machines were taken for a secondary application—that is, for the recovery of the starch being lost with the gluten after passing over the tables—since their use in this process was not involved in the patent controversy. However, this was a relatively minor use, and the machines required for it were so few in number that revenue derived from their sale was negligible so far as financing Merco's operations was concerned. Thus the financial situation Merco Centrifugal had to face was grim and, at times, seemed well-nigh hopeless. Indeed, it is the testimony of Clarence Brown that only by reason of the fine courage and faith of Charles W. Merrill was the Company able to survive and win. Merrill, it will be recalled, had originally agreed to finance Merco Centrifugal through its initial stages—which meant until it had perfected its machine. That itself had taken longer and cost much more than was anticipated and then, on top of this, to make its financial situation much worse, came the patent battle. Discussing this with the author, Clarence Brown remarked:

> "When we ran into all that trouble—a long and uncertain patent contest with a very large concern looming up ahead—many men, perhaps most men, would have given up; and none of us in Merco could have blamed Charlie Merrill if he had done so. But he simply wasn't the kind of man who quits when the going gets tough. Not only did he keep on pouring money into Merco—but it was his unfaltering faith and courage that cheered the rest of us on when we felt like throwing in the towel."

Brown went on to explain that, as Manager of Merco Centrifugal Company, it was his responsibility to find the money to keep the Company alive and to carry on the patent battle. And with the country still in

the throes of the World Depression, outside borrowing was impossible. So, with a heavy heart he would go to Charles Merrill and ask for additional financial help. "Never," he said, "did Charlie Merrill turn me down, and I always left him with my own confidence renewed. To me, his conduct all through this fight was a wonderful lesson in faith and courage."

That faith and courage finally were rewarded. At long last, after six years of "staggering along" for Merco Centrifugal, the Patent Office rendered its decision. It was a complete victory for Merco Centrifugal Company. The patent claims in controversy were all awarded to Merco.

Chapter 31

ALL'S WELL THAT ENDS WELL

THE DECISION of the U. S. Patent Office gave Merco Centrifugal Company a new lease on life. Unfortunately, it was to prove only a short lease. As soon as news of Merco's unconditional victory in the patent war spread throughout the cornstarch industry, orders for machines commenced coming in rapidly. However, before these orders could be filled the machines had to be built, and before manufacturing facilities could be established, the preliminaries of World War II cut off Merco's supply of some of the essential materials. Once again, through circumstances completely beyond its control, Merco's efforts to exploit its now-proven machine were halted. For another five years about all the Company could do was to mark time; not until World War II terminated and materials restrictions were lifted, could it make a fresh start.

Fortunately, the cornstarch industry had not meantime forgotten or lost interest in the Merco machine; and once the Company let it be known that it now was prepared to manufacture, orders began pouring in. Commented John Merrill:

> "It was like water running out of a reservoir when the dam breaks. You see, the efforts to get control of patents on the process had convinced other cornstarch manufacturers—far more conclusively than any claims we could make in its behalf—of the machine's and the process' value, and they all wanted it."

At last the Company, after more than a decade of difficulty and

struggle, was on its way. Not only did the Merco machine gain rapid and enthusiastic acceptance by all corn and maize starch producers—and many wheat starch plants—in the United States and Canada, but it also found a ready and growing market abroad.

Here, perhaps, it would be of interest to tell briefly what the Merco machine is and does.

Very basically, the machine comprises a rotating member or rotor in a completely enclosed housing. Feed slurry enters the machine through the top and falls to the rotating member. The rotor, spinning at speeds of up to 9,000 revolutions per minute, produces centrifugal forces from 4,000 to 9,500 times that of gravity. This force throws particles outwardly, concentrating them prior to discharge through nozzles. Overflow —extremely fine product and liquid—flows upwardly and is discharged near the top of the unit.

A rather unusual return flow system enables the Merco machine to be employed to wash solid particles. This permits relatively trouble-free nonstop, operation. In fact, depending upon both the specific problem and method of operation, the Merco can perform any one of a number of unit operations and sometimes more. It will concentrate, thicken, wash, clarify, classify or recover valuable dissolved soluble materials.

As we have previously learned, this machine got its start in the starch field. Today, much of the Merco business is still in this industry, where the machine is particularly applicable to both primary starch-gluten separations and thickening. However, in recent years its applications have been considerably broadened to include the chemical, pharmaceutical, food processing and, most recently, the petroleum industries. The Mercos —as they have come to be familiarly known—are made in five sizes—a pilot plant unit and four commercial-size machines—capable of processing from one to 350 gallons per minute.

In extending the field of usefulness for the Merco machine, Merco research engineers, under the direction of John Merrill, conducted a wide variety of tests with various sludges, slurries and pulps. Some of this research was carried on in the plants of customers, and here Merco engineers also mapped out the mechanics and economies of the process, took

charge of installations and operations, and directed the training of operators. Also, in its programme to assist the Chemical and the Food Processing industries in solving their separation problems, Merco provided engineering consultation services in the field as well as at the Company's offices.

The wold-wide success of the Merco machine confirmed the unfaltering faith which Charles W. Merrill had in it from the beginning. And ultimately that success led to an offer to Merco Centrifugal Company to merge with Dorr-Oliver, Inc., a large and flourishing concern which was founded by a life-long friend of Charles Washington Merrill, and which in 1954 took over the Merrill-Crowe Precipitation Process. Of this merger, which was completed in 1956, John V. N. Dorr, Board Chairman of Dorr-Oliver, Inc., wrote:

> "Some years ago we heard of the Merco Centrifuge and the success it was having under the leadership of Jack Merrill. Dorr-Oliver last year took over the precipitation end—the Merrill-Crowe Process—no stranger to us, for we have used it for years in cyanide plants of our design, and it has been handled by our European Associates under a license agreement for the past twenty-five years.
>
> "Now the Merco Centrifugal will join us. We are most happy to welcome Jack Merrill on our Board, and those of us who have met members of the staff now coming with us, know that they will add greatly to our group. Old-timers, I know, will feel that again we cement a friendship of many years."

President J. D. Hitch, Jr., of Dorr-Oliver, in announcing the election of John L. Merrill to the Board of Directors of this company said:

> "Dorr-Oliver welcomes John Merrill to its Board of Directors, and most happily adds to its world-wide staff the competent research, engineering, clerical, sales and production employees of Merco Centrifugal Co. Working together, we look forward to develop-

ing many new uses for their products for distribution to a greatly expanded, world-wide market."

When John V. N. Dorr spoke of "cementing a friendship of many years," he was alluding to the fact that he and Charles Washington Merrill met and became friends in the Black Hills of South Dakota, when Dorr was running the Rossiter Cyanide Mill and Merrill was making cyanide history at The Homestake. Their friendship was maintained throughout all the intervening years; and it was appropriate that Merco Centrifugal, a concern founded and carried to eminent success under the leadership of Charles Merrill, should merge with the company founded and headed by his old friend of the Black Hills.

Chapter 32

IN WORLD WAR II

TO ANYONE who knew him, it will not be surprising to learn that when America found herself involved in another World War, Charles Washington Merrill—and his eldest son, John, who had assumed a leading rôle in the several companies' activities—immediately gave their whole attention to determining how they and their associates could best aid the nation. There were long, earnest discussions of whether it would best help the war effort for members of the Merrill Organization to offer their services to the Government individually or as a group. In the end it was concluded that they could make a far greater contribution by group action; and, having reached this decision, they at once put themselves, their companies, and all their collective engineering and technological capacities at the disposal of their country. "Tell us," they said to the Washington authorities, "what you want us to do, and we will do it!"

One of the products drastically needed by the U. S. Army at this time was magnesium powder—the principal ingredient in tracer bullets for fighter planes, and vitally necessary for use in parachute and signal flares, as also in illuminating flares for aerial night photography of enemy territory. As this material had been produced only in small quantities heretofore, the Government, through the Army Ordnance Department at San Francisco, requested The Merrill Company to begin its manufacture at the earliest possible moment.

Accordingly, The Merrill Company proceeded to organize a sub-

Plant of Metals, Inc., subsidiary of The Merrill Company in Albany, California, which produced vital materials for the Armed Forces in World War II.

sidiary, Metals, Inc., which signed a contract with the Government, under which Metals, Inc., agreed to erect and equip a plant to produce this vitally needed material.

Top priorities were issued and a new plant, consisting of twelve separated structures, was designed and constructed in Albany, California (just across the Bay from San Francisco), in record time. In designing these structures, safety and speed were the paramount considerations. Since magnesium powder is of exceedingly high combustibility, automatic controls were installed to reduce the normal hazards, and special machinery was designed and installed to simplify and speed operating procedures.

In building and equipping the plant, The Merrill Company's engineers worked night and day, as it was necessary to improvise and adapt because of the impossibility of obtaining a great deal of the necessary standard equipment. And while the engineers were so engaged, other members of The Merrill Staff were equally busy expediting other phases of the project. Herbert S. Shuey took care of all matters pertaining to finance, and George J. Schlenker served as liaison man with the Government officials, and as coordinator.

Because of the necessity of conserving manpower, the Government urged the use of women workers to the fullest possible extent, and this was done through putting men only in supervisory and maintenance operations. Approximately 100 people were employed and given preliminary training while parts of the plant were still under construction. When fully completed, the plant immediately went on a three-shift, around-the-clock, basis.

The need for the product was so great that the powder was taken by the Government as fast as it could be packed in containers. Speed—with safety—was the constant watchword; and, despite the fact that this plant turned out more magnesium powder than the contract stipulated, and at a faster pace, so well was the whole operation planned, supervised and handled that there were no fires or accidents—a most unusual record!

The success of this whole operation—from the erection of the plant on through the manufacture of its highly needed product—proved the exceptional capabilities and splendid teamwork of the whole Merrill

Organization. The late Minton Newell was in charge of the plant; and his son, Joseph Newell, had charge of production. Raymond Byler was the engineer and research expert who overcame many difficulties and designed many novel contrivances to save time. John L. Merrill, President of Metals, Inc., was the "sparkplug" and virtually "commuted" between San Francisco and Washington—to keep things running smoothly. And the entire operations had at all times the sound, sage and mature advice of Charles W. Merrill, whose vast experience enabled him time and again to provide the solution of a knotty problem.

As an earnest of its gratitude for this splendid contribution to the success of the war effort, the Government awarded Metals, Inc., the much-coveted Army and Navy "E."

Chapter 33

MORE SERVICE TO COUNTRY

By the middle of the year 1943, the splendid record The Merrill Company's organization had made—through Metals, Inc.—in producing magnesium powder was so well known to the Government that it requested the Company to undertake another special production job for the Armed Services: the manufacture of aluminum powder.

This material, which was in very short supply, was vitally needed as an important component of the gunpowder used in propelling large-calibre projectiles from battleships, as well as for the fire-bombs which were being used so successfully over Germany. Previously, there had been none produced on the Pacific Coast, and the Government deemed it extremely important to have a West Coast supplier.

Once more. The Merrill Company engineering and technological staff responded promptly. Organizing The Merrill Products Company, they signed a contract with the Government and went into immediate action. A section of the Emeryville, California, plant of one of The Merrill Company subsidiaries—The Alloys Company—which had been used principally for producing zinc powder, was set aside for the manufacture of aluminum powder.

Although some internal remodelling had to be done, the saving in time—as against erecting and equipping an entirely new plant—was very substantial; and here, again, time was critically of the essence. Research was carried out under great pressure, and plant reconstruction was completed and manufacturing facilities established in record time.

One of the greatest obstacles Merrill Products Company had to surmount was the shortage of labor, since women could not be used in this hot and heavy work, involving furnaces kept constantly at great heat. This problem was solved mainly through everyone in the Merrill organization assuming additional assignments and burdens, and working even longer hours. By this means, with a minimum of additional manpower, the plant was able to operate on an around-the-clock basis, supplying large quantities of aluminum powder to the United States Navy, and helping greatly in overcoming the shortage of this vitally needed material.

In speaking of the difficulties and accomplishments of this manufacturing operation, George J. Schlenker, one of Charles Merrill's staff, recently stated:

> "A tribute is due the men and women in the Government agencies involved—the Navy, the Chemical Warfare Service, the Defense Plants Corporation, et. al. Their general attitude reflected their realization that the acceleration of production of this vitally needed material might save lives—American lives—so the green light was flashed in the extension of priorities and assistance in obtaining the equipment and services required to do the job.
>
> "The dynamo which sped this operation was John L. Merrill, whose energy seemed without limit and who, when necessary, pleaded and goaded his associates into doing the seemingly impossible. It was as though he were in all places at the same time—in the office, in the plant, on a plane to Washington, and being bumped off a plane some place in 'the sticks,' and telephoning frantically to Washington for a higher priority in order to get to his destination. He had the able assistance of his associates in Metals, Inc.—the Newells and Raymond Byler, and of Ralph Halbach who, at night, literally slept alongside his furnaces and awakened at the slightest change in the pitch of their scream."

Here, again, the slogan and shibboleth was "speed with safety," and all things else were subordinated to that battle cry.

Award of Army-Navy "E" to Metals Inc., in Albany, California, during World War II.

WAR DEPARTMENT
OFFICE OF THE UNDER SECRETARY
WASHINGTON 25, D. C.

19 February 1944

To the Men and Women
of Metals Incorporated
1069 - 2nd Street
Berkeley 2, California

This is to inform you that the Army and Navy are conferring upon you the Army-Navy Production Award for your fine record in the production of war equipment.

The Award consists of a flag to be flown above your plant and a lapel pin which every man and woman in your plant may wear as a symbol of high contribution to American freedom.

This award is your nation's tribute to your patriotism and to your great work in backing up our soldiers on the fighting fronts. I have full confidence that your present high achievement is indicative of what you will do in the future.

Sincerely yours,

Robert P. Patterson
Under Secretary of War

Production Award to Metals Inc., subsidiary of The Merrill Company, by the Army-Navy for achievement in production of war equipment—February 19, 1944.

> "It was," continued Schlenker, "a grim affair. The Services were crowding us constantly to produce more and more; labor conditions were atrocious because mostly only green help could be obtained, so it was a case of every day being a battle. I can still recall the great sensation of relief when the operation happily was permitted to cease, and the mutual feeling of gratification that 'this was a job well done'."

The Merrill Products Company's original contract was with Chemical Warfare Service and called for the production of "aluminum *grained* powder"; and not only did the first pound produced meet all specifications, but, within a very brief period after opening, plant production rose to 125 per cent of rated capacity.

Later on, when Chemical Warfare Service curtailed procurement of aluminum grained powder, the Navy requested prompt conversion of the plant to production of a finer grade of aluminum powder. Production of this material ,commenced even before conversion was completed, rose from 268,000 pounds a month to over 400,000 pounds a month. All terms and conditions of the Navy contracts were fulfilled, every specification was met, and not a single lot of powder was rejected!

This operation ended shortly after V-J Day, and the Company was cited for "distinguished service" by the United States Navy, and awarded its special "Certificate of Achievement."

Chapter 34

HONORS AND REWARDS

RELATIVELY few men are bequeathed the natural endowment which enabled Charles Merrill to climb to the heights of his profession, and to succeed signally in business as well. What was this endowment?

Besides the goodness which Benjamin Franklin held indispensable to greatness, it was that rare combination of true scientific spirit, clear thinking, inventive ability, and real executive business capacity. Seldom are all of those qualities united in the same person, and still more seldom to the degree in which they were found in Merrill.

Ever meticulously honest in appraising himself, he gave to this endowment—to this "gift of the gods"—rather than to himself the credit for a long line of achievements. Thus, in the face of a spate of honors and rewards, his deep, abiding humility. He could not be vainglorious concerning these laurels, and what they represented, because he knew that they accrued to him—and belonged to him—only as he was the trustee, the custodian, of that rare natural endowment.

That is why his honors, and there were many, rested lightly on him. That is why his rewards, and they were numerous, were shared so generously with others. That is why, throughout a long life, his great desideratum—the one deep, stirring impulse that actuated and impelled his efforts—was to improve, to better, to *create,* to make three blades of grass grow where but one had grown before. He did not covet honors or seek rewards. They came to him—incidentally and gratuitously—because he did unerringly that which creates rewards and engenders honors.

On December 7, 1945, the U. S. Navy awarded the Merrill Products Company a Certificate of Achievement for its distinguished war service.

> "Only if I succeed in making my Cyanide Process profitably applicable to Homestake do I expect or want anything for my time and efforts spent in its installation. I believe I will succeed. But if I should not, I neither want nor will accept compensation."

That was the terse, pregnant statement made to veteran Superintendent Thomas J. Grier of the Homestake Mine by the young metallurgist, Charlie Merrill, in proposing an installation of his Cyanide Process. And that was the essence of the code and creed by which his whole life and entire career were motivated and governed.

With such a code and creed, with such an attitude, the exceptional success he achieved—in his profession, in business, and as a civic leader—was inevitable. Today, just as two thousand years ago, men do not gather grapes of thorns or figs of thistles. Today, no less than twenty centuries ago, men inescapably reap whatsoever they sow; and the harvest of rewards and honors that came to this man was but the natural fruitage of the seeds he had sown.

For Charles Merrill, this harvest began early and ended late; began while he was in high school and college, and ended only when, after four score years and six, he was summoned hence. In high school his fellows elected him to high student office; in college his classmates selected him as Editor of the *Blue and Gold;* later this college chose him as the first recipient of its degree of Metallurgical Engineer; and to within a few months of his life's end, the stream of honors flowed on.

Throughout more than half a century awards and laurels came to this man from far and wide. Some of them have been described in detail earlier but will bear brief further mention now, by way of summary.

He was chosen by U. S. Food Administrator Herbert Hoover to be Chief of the Division of Collateral Commodities during World War I.

He was awarded the James Douglas Gold Medal (the second recipient) for distinguished metallurgical achievement.

He was elected Vice President and then President of the Alumni Association of the University of California, and a Member of the University's Board of Regents.

He was selected to head the San Francisco Community Chest during three of its formative and most difficult years; later was made Chairman of the San Francisco Bay Area Community Chest.

He was elected to the American Institute of Mining and Metallurgical Engineers, and became its Vice President; to the Chemical, Metallurgical & Mining Society of South Africa; to the Mining & Metallurgical Society of London; to the Australian Institute of Mining Engineers; to the Inventors' Guild of New York; to the American Electrochemical Society; to the Sigma Xi Scientific Honor Society; to the Sons of the American Revolution; to the English Speaking Union, of which latter—along with Professor Charles Mills Gayley—he was one of the moving spirits.

He was chosen a Governor of the Commonwealth Club of California, a Trustee of the California School of Mechanical Arts, a Director of the Oakland Children's Hospital, Vice President of the California Conference of Social Work, and a Trustee of the Lick-Wilmerding School of Mechanical Arts.

He was elected Chairman of the Minerals Committee of the California State Chamber of Commerce, and Chairman of the California State Mining Board.

He was given the National Modern Pioneer Award of the National Association of Manufacturers "in recognition of distinguished achievement in the field of science which has advanced the American standard of living."

These are some, but by no means all of the community, state, national and international societies, institutions, and other distinguished organizations—reaching from San Francisco to South Africa, from London to Australia—which, in recognition of his world-embracing and world-bettering achievements, paid their highest tributes to Charles Washington Merrill.

No man could fail to appreciate such world-wide recognition and commendation. But the tribute this man most cherished, the one dearest to his heart, was that simple utterance of his old-time Homestake Associate:

"Whatever Charlie Merrill touched, he always made it better!"

Chapter 35

HOMO FABER

THE VALIDITY of the quotation with which the preceding chapter concluded is abundantly sustained by the record of Charles Merrill's career. In addition to developing and exploiting his own numerous inventions, discoveries, equipment, etc., in the field of metallurgy, mining and engineering, he improved, developed and marketed many processes, mechanisms and devices which were the discoveries or inventions of other men, but which still were in an embryonic or otherwise unusable stage when they came to his door. Indeed, some of his most fruitful work was in perfecting and adapting—and thus making eminently successful—metallurgical processes, equipment or methods which, in their original state, had proven failures.

An early example of this was his successful adaptation of the Cyanide Process to the ores of Homestake Mine. He did not, as we have previously learned, invent the original cyanide process. However, what he did was equally, if not more, important. For through intensive study, testing and experimentation, he discovered and eliminated its defects and thus transformed it from a failure to a resounding success.

Naturally, this made his name known around the world, and even before the end of his work at Homestake, he was beginning to be regarded as something of a "wizard" in the metallurgical field. Consequently, it was to be expected that, after establishing his organization in San Francisco, he was increasingly called upon to study and test new processes, equipment, etc., brought to him for his verdict as to their intrinsic worth and marketability.

In the nature of things, a great many of these—for one reason or another—failed to pass muster. In a conversation with his chronicler, Merrill remarked that he had no idea of how many hundreds of hours he had spent in studying and testing inventions which proved to be, from a practical standpoint, worthless. He added, however, that "I never regretted it or regarded it a waste of time because I considered it my duty to my fellow-workers in this field, and usually I learned something valuable in the experience. Furthermore, every once in awhile, good things would come along—things that proved to have real merit; and these more than made up for the others."

It was in respect of these "good things" that Merrill constantly expanded the basis for the statement that whatever he touched he bettered. Given something intrinsically sound, yet requiring further development to make it practically and widely useful, it was worked on by Charles Merrill and his associates until so perfected and adapted that it found usage all over the world.

Frequently, too, someone came to him with a process or piece of equipment—similar to one of his own inventions—claiming for it some element of superiority to the Merrill product. In such instances he gave further proof of being imbued with the true scientific spirit. Instead of being indifferent or disdainful, he investigated it willingly and with complete objectivity. And if he found a process, for instance, to possess some qualities which were superior or complementary to certain of his own, he made its inventor or originator a generous offer whereby the two processes would be merged—combining the best elements of each—then developed and marketed as one.

Such, for example, was the case with the Merrill Precipitation Process, now technically known everywhere as the "Merrill-Crowe Simultaneous Clarification-Deaeration-Precipitation Process." This was a combination of the best elements of the precipitation processes of Merrill and Thomas B. Crowe, and is now used almost exclusively throughout the world.

Another example was the process for manufacturing the zinc dust used in the Merrill Cyanide Process. The invention of engineer Minton

World's largest cyanide precipitation plant. Ten Merrill-Crowe Vacuum Filter units handling approximately 20,000 tons of solution daily at Randfontein, South Africa.

Guerrero Mill—Compania Real del Monte y Pachuca. This company, largest silver producer in the world, was precipitating 4,000 tons of solution daily by the Merrill Process when this photo was taken.

H. Newell, it was brought to Merrill by him. Convinced of its efficacy, Merrill agreed to take it over and develop it; whereupon The Alloys Company, of which Newell became Vice President, was organized to manufacture this product and market it world-wide.

The Merco Centrifugal, already described in detail, is likewise an example of the same Merrill capacity and policy. Here, he and his associates combined the best features of the separate inventions of two men, to create a mechanism which, besides making revolutionary changes in the manufacture of starch, has found wide and increasing use in a variety of important basic industries. Other examples include the Merrill Cyanide Recovery Process, the Merrill-Crowe Deaeration Process, the Merrill-Mills-Crowe Vacuum Leaf Precipitation Process, the Merrill-Mills-Crowe Precoat Clarification Process, the Merrill Webster-Dosenbach Process for recovery of copper from ore containing oxidized or acid soluble copper, the Merrill Cyanidation-Flotation Process for the recovery of gold and precious-metal-bearing sulphides, the Merrill Silver-Dorfman Process for the special cyanide treatment of carbonaceous gold ores, and numerous other variations and adaptations of one or more of these processes.

All of these stand as irrefutable proofs of Charles Merrill's extraordinary ability to better anything he touched, and all of them have inured to the great advantage and profit of industry in all regions of the globe. In so doing, they incidentally brought substantial financial rewards to Charles Merrill and his associates, thereby validating another tenet in the Merrill Code and Creed. "Early in life," he observed to the writer, "I came to the conclusion that if I could succeed in creating something widely useful, something of genuine benefit to mankind, all the money I could want would come to me automatically, and it did." And then, after a moment's pause, he added: "That proves to me that if a man fully lives up to his obligation to society, he needn't worry about reward."

Here, as in so many other aspects of his thinking, Charles Merrill displayed his understanding of a cosmic law. Studying history, we observe that even in the earliest and simplest phases of human society, the superior man becomes conscious that he owes something; that he has an obligation to fulfill. It is out of this consciousness that there comes the concept that

control over nature includes control over human nature; from which, in turn, accrues the Ethic of Service—service to God, service to country, to community, to mankind. Armed by this concept and imbued with this ethic, Charles Washington Merrill was *homo faber*—man the maker, man the creator, servant of mankind.

In the Appendix there appears a list of the installations of The Merrill Company's metallurgical processes and equipment throughout the world. Suffice it to say here that the number of them runs to well over five hundred, and that they are to be found in all of the most famous and productive gold and silver mines in the U. S. A., Canada, Mexico, Australia, New Zealand, Philippine Islands, Gold Coast Colony, Kenya Colony, South Africa, Argentina, Brazil, Chile, Colombia, Honduras, Ecuador, Nicaragua, Peru, Venezuela, Cyprus, Tanganyika, Java, Cuba, The Netherlands, Dutch Guiana, and Saudi Arabia.

Indeed, it can be said without exaggeration that the Merrill processes and equipment are in use today in mining operations in every inhabited region of the globe! Wherever in use, they are vastly augmenting the output of the world's precious metals, and at the same time greatly lessening the costs of production. Thus the author of an article appearing in a leading metallurgical journal was speaking by the book when he wrote:

> "It may be conservatively stated that, through his rare inventive genius, Charles Washington Merrill has added untold millions to the wealth of the world."

Chapter 36

"THIS WAS A MAN"

FOR MORE THAN a full decade beyond the Biblically allotted three score years and ten, Charles Merrill worked as he had always worked: continuing to head The Merrill Company and most of the other organizations he had established; continuing to study and test and experiment and advise; continuing to collaborate with his associates and staff in a variety of old and new undertakings.

Only after he had reached his eighty-third milestone did he accept the idea of "slowing down a little." He did relinquish the Presidency of The Merrill Company—to his eldest son, John L. Merrill, who had been with the Company and its affiliates for twenty years—to become Chairman of the Board. And he did consent to come to the office three days a week instead of five. Even so, he still took plenty of work home to keep him busy on his "days off," and on those days might call the office several times to ask about this or to suggest that. Indeed, his only real concession to the years was an annual winter vacation in Honolulu, where he and his wife would remain from December through March, and where every morning he had his coveted swim in the surf.

He did this, however, not so much because he felt its necessity as because he thoroughly enjoyed it—the delightful sea voyages aboard the Lurline, where everyone from Captain to Cabin-boy knew him; the beauty of the Hawaiian flora; the fine facilities for his favorite pastime—swimming; the charm of vacation life in "the Paradise of the Pacific." There, as he put it, he did "duck out of work for three months," but

when he returned to San Francisco it was to pull his full oar again. Oh yes, there was one other lapse. During the World Series he played hooky and stayed home to watch on television the kings and princes of his next to favorite sport perform in their annual classic.

With these exceptions, Charles Merrill paid no heed to age, and for him the so-called "declining years of life" never came. Throughout his eighty-sixth year, in excellent health, he was active in all his affairs; and although deafness required use of a hearing aid, he still read and worked without glasses.

In late November of 1955, he and Mrs. Merrill sailed to Honolulu; and there, on the 21st of December, he celebrated the opening of his eighty-seventh year by taking a long swim. During January, 1956, he was in his usual good health; and on the 3rd of February his San Francisco office received from him a business letter, written the day before, in which, after expressing himself with his customary clarity and precision concerning the business matter, he jestingly offered his "sympathy" to his associates for their "having to toil while the 'boss' loafs and plays."

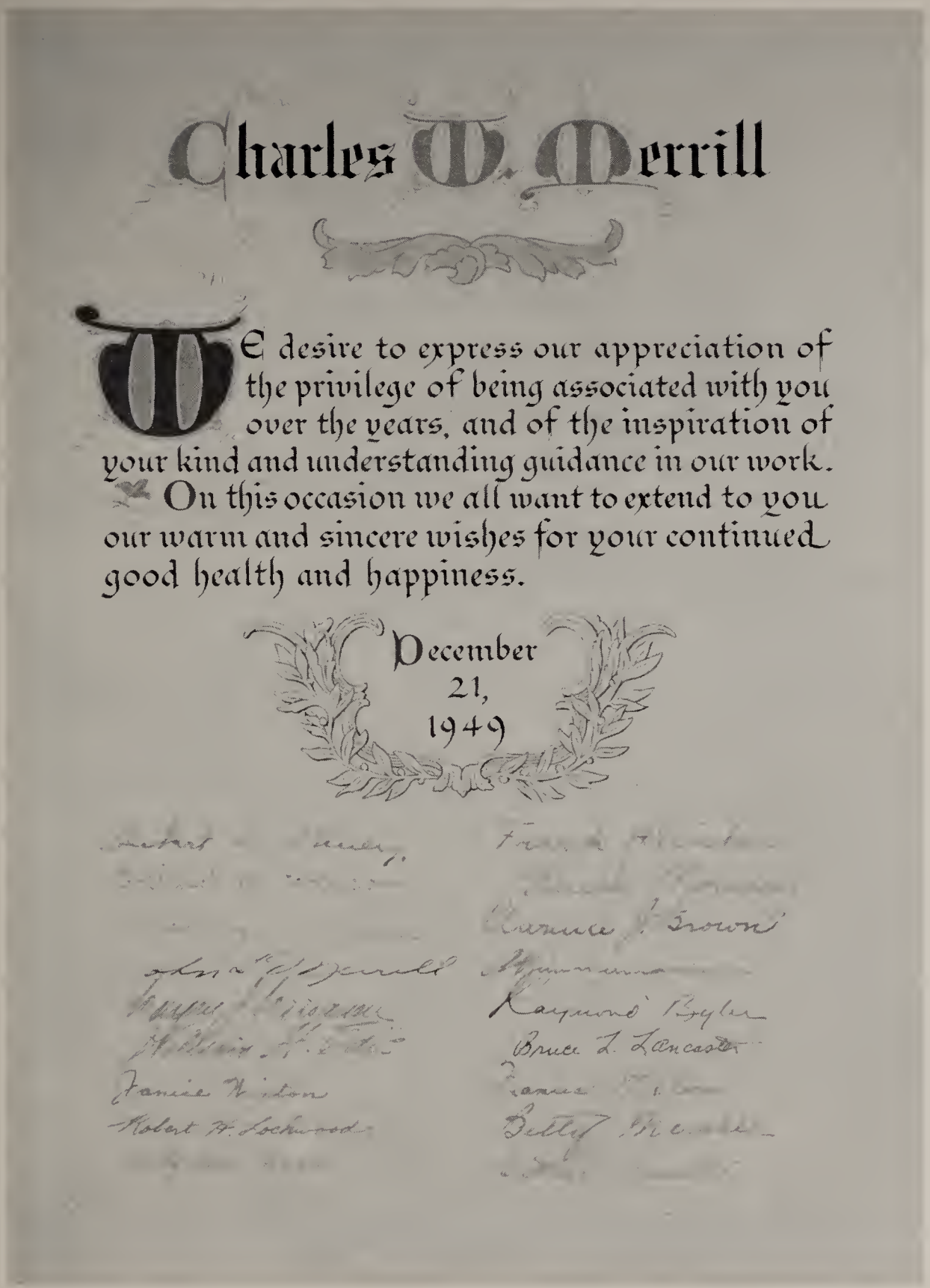
That was the last letter Charles Merrill wrote. Two days later he was stricken suddenly; and, on the morning of the 6th of February, 1956, death came for him.

* * *

Despite the marvels of science, despite the advancement of knowledge, despite all our gains in understanding, life's essential mysteries are yet unfathomed. We have, to be sure, widened and vastly improved the road leading to the house with the door to which there is no key. But, in the face of all our wit and ingenuity, that locked door still remains securely locked against us.

Reflections upon the life and career of Charles Washington Merrill soon bring us to that locked door. Why is it, we seek to know, that one man falls fatally at fifty or sixty, while another goes on working in full vigor and effectiveness to eighty or beyond? What is it, we wonder, that enables—or compels—one man in a million to do that which none other in that entire million can or will do?

Contemplating Charles Merrill's unusually long active life and his


Charles W. Merrill
We desire to express our appreciation of the privilege of being associated with you over the years, and of the inspiration of your kind and understanding guidance in our work.
On this occasion we all want to extend to you our warm and sincere wishes for your continued good health and happiness.
December 21, 1949

Tribute by staff of The Merrill Company to Charles W. Merrill on his 80th birthday.

world-renowned achievements, we are bound to ask these questions. And equally bound to fail to find answer until, out of the silence, comes the clear voice of the seer, the poet, saying: "There's a Divinity that shapes our ends . . . !"

News of the death of Charles Merrill brought to his family and business associates messages of sympathy from far and wide. They came from old friends and professional associates in many places, from men in widely different fields of endeavor; and, besides paying tribute to his character and accomplishments, all of them registered deep personal affection for the man. Representative of them was the message to John, Gregor and Bruce Merrill from the man who had been their father's friend since youth, and his comrade in war service during World War I, Herbert Hoover:

> "I grieve with you at the passing of your father. He was my steadfast friend for over fifty years. He was a devoted American, continually steadfast in service to the American people. I want you to know of my deep sympathy with you in your great loss."

The mortal life of Charles Washington Merrill is ended. But not the life of his spirit. That spirit lives on today, and must continue to live on tomorrow and tomorrow—in the hearts and minds of his family, his friends, his professional and business associates, in the institutions he builded, and in the long record of his enduring service to mankind. His was a good life, a full life, a kindly life, an altogether worthy and abundantly fruitful life, shedding bright, warm light in ever-widening circles; a life faithful to rectitude, to honor and to highest duty. Of him who led it, well might we repeat, as benediction, the final words of Antony's immortal tribute to the fallen Brutus—

> His life was gentle, and the elements
> So mix'd in him that Nature might stand up
> And say to all the world "This was a man!"

THE END

INSTALLATIONS OF MERRILL COMPANY PROCESSES AND EQUIPMENT THROUGHOUT THE WORLD

UNITED STATES:

Alaska Treadwell G.M. Co.
Alvarado Gold Mining Co.
Amador Metals Reduction Co.
American Barium Company
Azurite Mine-A. S. & R. Co.
Anaconda M & M Co.
Argenta Consol. Goldfields
Argentum M. Co. of Nevada
Argonaut M. Co. Ltd. (Jackson)
Argonaut M. Co. Ltd. (Plymouth)
Aurora Ore Purch. & Reduction
Aurora Consolidated M. Co.
Baker Mines Company
Bald Mountain Mining Co.
Beebe Gold Mining Company
Belhelen Mines
Belmont Shawmut M. Co.
Black Oak Development Co.
Black Mammoth Consolidated M.
Bradshaw Syndicate Inc.
Buckhorn Mines Co.
Burton Bros. (Ruth Mine)
Burton Bros. (Tropico Mine)
Butte Highlands M. Co.
Cactus Mines Inc.
Caliente Cyaniding Co.
Candelaria Mines Co.
Casa Madera G. M. Syndicate
Central Tailings Co.
Chaffin Lease
Chicagoff Development Co.
Columbus G. M. Co.
Commercial Mining Co.
Commonwealth M & M Co.
Confidence Gold M. Co.
Congress Mining Corporation
Consolidated Chollar G & S M. Co.
Consol. Cortez Silver M. Co.
Cornucopia Mines Co.
Dairy Farm Gold M. Co.
Dayton Consolidated M. Co.
Dayton Placer Recovery Co.
Deer Trail Mining Co.
Delta Tailings Co.
Demming Exploration Co.
Densmore Mines
Desert Silver, Inc.
Doss Mining Company
Campagne du Boleo
Eagle Shawmut Mining Co.
El Dorado Crystal Mine
Elko Prince Leasing Co.
Elkoro Mines Company
Empire Mines Company
Empire Star M. (Zeibright)
Ermont Mines Inc.
Esmeralda G. M. Ltd.
Exploration Synd. Inc.
First Thought M. Corpn.
Flowery Mines Co.
General Metals Recy. Corp.
Gertrude Mining Co.
Getchell Mine Inc.
Geyser Marion G. M. Co.
Gilt Edge Mines
Golden Cycle M & R Co.
Gold Crown Mining Co. Ltd.
Golden Center Mine
Golden Queen Mining Co.
Goldfield Consol. M. Co.
Gold Hill Development Co.

UNITED STATES (Continued)
Gold Road Mines Co.
Grass Valley Consol. G. M.
Haile Gold Mines Inc.
Hayden Hill Gold Corpn.
Homestake Mining Co.
Howe Sound Co-Chelan Div.
Hughes-Mitchell Proc. Inc.
Idaho-Maryland Mines Co.
Kansas City, Nevada G. M.
Katherine Gold M. Co.
Kennedy M & M Co.
Knob Hill Mines, Inc.
Latham and Goble
Lewis Investment (Benton M)
Little Ben Mining Co.
Mammoth-St. Anthony Ltd.
Manning Gold M. Co.
Metals Exploration Co.
Midas Gold M. Co.
Minnesota Mines Co.
Mogollon Mines Company
Molybdenum Gold Mining Co.
Monarch Mining Company
Mono Mines
Mountain Copper M. Co. Ltd.
Nevada Austin M. Co.
Nevada Lucky Tiger M. Co.
Nevada Packard Mines Co.
North Star Mines Co.
Northumberland M. Co.
O'Brien, Glen T. & T. S.
Ohio Mines Corporation
Olympic Mines Co.
Patterson Mining Co.
Penelas Mining Co.
Pittsburgh Silver Peak G. M.
Portland Gold Mining Co.
Prescott Lease
Presidio Mining Co.
Queen of the West M. Co.
Rapp and Till
Rattlesnake Jack M & M Co.
Tom Reed Gold Mines Co.
Rochester Combined Mines
Rochester Silver Corpn.
Roseklip Mines Co.
Ruby Gulch Mining Co.
Seven Troughs Gold M. Co.
Sheeptanks Consol. M. Co.
Silver Creek Gold M. Co.
Smith Mountain Mill
Snyder Mines, Inc.
Spanish Mine
Standard Cyanide Co.
Star Gulch Mining Co.
Stargo Mines Inc.
Stone Cabin Consol. M. Inc.
Summit King Mines Ltd.
Summitville Consol. M. Co.
Sutro Tunnel Coalition Inc.
Telluride Mg. M & D Co.
Tonopah Belmont Dev. Co.
Tonopah Extension M. Co.
Toroda Gold Mines
United Comstock M. Co.
United Eastern M. Co.
U. S. Smelting, Ref. & M. Co.
U. S. Treasury Mining Co.
Weepah Nevada M. Co.
Willow Creek Mines, Inc.
Wyoming Plat. & G. M. Synd.
Yellow Aster Mine-Anglo Am.
Yellow Pine Company

CANADA:
Aunor Gold Mines, Ltd.
Argonaut Gold Limited
Arntfield Gold M. Ltd.
Ashley Gold M. Corpn. Ltd.

CANADA (Continued)
B.R.X. (1935) Consol. M.
Bankfield Consol. M. Ltd.
Bayonne Consol. M. Ltd.
Beattie Gold M. Ltd.
Berens River Mines Ltd.
Bidgood Kirkland G. M. Ltd.
Broulan Porcupine M. Ltd.
Buena Vista M. (Big Missouri)
Buffalo Ankerite G. M.
Canadian Malartic G. M. Ltd.
Canadian M. & Finance Co.
Cariboo Gold Quartz M. Co.
Cariboo Hudson G. M. Ltd.
Central Cadillac M. Ltd.
Central Manitoba M. Ltd.
Central Patricia G. M. Ltd.
Chesterville Larder Lake G. M.
Cline Lake Gold M. Ltd.
Cochenour-Willans G. M. Ltd.
Coniaurum Mines, Ltd.
C. M. & S. Co. of Canada (Box)
C. M. & S. Co. of Canada (Con)
C. M. & S. Co. of Canada (Cordova)
Cournor Mining Co. Ltd.
Dentonia Mines Limited
De Santis Porcupine M. Ltd.
Dome Mines, Limited
East Malartic Mines, Ltd.
Esmeralda Gold M. Ltd.
Faymar Porcupine G. M. Ltd.
Francoeur Gold M. Ltd.
God's Lake Gold M. Ltd.
Gold Belt Mining Co. Ltd.
Gold Eagle G. M. Ltd.
Gold Hill Mines, Ltd.
Golden Gate Mining Co. Ltd.
Golden Manitou Mines Ltd.
Greene-Stabell M. Ltd.
Gunnar Gold Mines, Ltd.
Gurney Gold Mines, Ltd.
Hallnor Gold Mines, Ltd.
Hard Rock Gold M. Ltd.
Hasaga Gold Mines, Ltd.
Hedley Gold M. Co. Ltd.
Hedley Mascot G. M. Ltd.
Hollinger Consol. G. M. Ltd.
Hooton, W. A.
Howey Gold M. Ltd.
Hoyle Gold M. Ltd.
Hudson Bay M & S Co. Ltd.
Island Mountain M. Co. Ltd.
J. M. Consolidated G. M. Ltd.
Jason Gold M. Ltd.
Kelowna Exploration Co. Ltd.
Kenricia Gold M. Ltd.
Kerr-Addison Gold M. Ltd.
Kirkland Lake G. M. Ltd.
Kootenay Belle G. M. Ltd.
Laguna Gold M. Ltd.
Lake Rose Mines, Ltd.
Lake Shore Mines, Ltd.
Lamaque Gold M. Ltd.
Lapa Cadillac G. M. Ltd.
Laval University
Lebel Oro M. Ltd.
Leitch Gold M. Ltd.
Little Long Lac G. M. Ltd.
McIntyre-Porcupine M. Ltd.
McKenzie Red Lake G. M. Ltd.
McMarmac Red Lake G. M. Ltd.
McMartin, J. Bruce
McMillan Gold Mines, Ltd.
McWatters Gold Mines, Ltd.
Macassa Mines, Ltd.
MacLeod-Cockshutt G. M. Ltd.
Madsen Red Lake G. M. Ltd.
Magnet Consol. M. (1936) Ltd.
Malartic G. F. Ltd.
Matachewan Consol. M. Ltd.

CANADA (Continued)
Moneta Porcupine M. Ltd.
Morris Kirkland G. M. Ltd.
Naybob Gold M. Ltd.
Negus Mines Limited
New Darwin Gold M. Ltd.
New Golden Rose M. Co.
Night Hawk Peninsula M. Ltd.
Nipissing Mining Co. Ltd.
Noranda Mines, Limited
Northern Empire M. Co.
O'Brien Gold M. Ltd.
Omega Gold Mines, Ltd.
Ontario Kirkland G. M. Ltd.
Pamour Porcupine M. Ltd.
Paymaster Consol. M. Ltd.
Perron Gold M. Ltd.
Pickle Crow G. M. Ltd.
Pioneer G. M. of B. C. Ltd.
Porcupine Crown Mines
Porcupine Paymaster M. Ltd.
Porcupine-Vipond M. Ltd.
Powell Rouyn G. M. Ltd.
Preston East Dome M. Ltd.
Privateer Mine, Ltd.
Queen M & M Co. Ltd.
Relief-Arlington M. Ltd.
Reno Gold Mines, Ltd.
Ronda Gold Mines, Ltd.
Sachigo River Explor. Co.
St. Anthony Gold M. Ltd.
San Antonio Gold M. Ltd.
Sand River G. M. Ltd.
Schumacher G. M. Ltd.
Seal Harbor G. M. Ltd.
Shawkey Gold M. Co. Ltd.
Sheep Creek G. M. Ltd.
Sigma (Quebec) Limited
Siscoe Gold M. Ltd.
Sladen Malartic M. Ltd.
Stadacona-Rouyn M. Ltd.
Sullivan Consol. M. Ltd.
Sylvanite Gold M. Ltd.
Teck-Hughes Gold M. Ltd.
Thompson-Cadillac M. Corpn.
Toburn Gold M. Ltd.
Tough Oakes Burnside G. M.
Tyranite Mines, Limited
Uchi Gold Mines, Ltd.
Upper Canada M. Ltd.
Vipond Consolidated M. Ltd.
Wayside Consol. G. M. Ltd.
Wendigo G. M. Ltd.
Wesko M. (Center Starr Mill)
Wood Cadillac M. Limited
Wright-Hargreaves M. Ltd.
Ymir Yankee Girl G. M. Ltd.

AUSTRALASIA:
Big Bell Mines, Ltd.
Blackwater Mines Ltd.
Boulder Perseverance Ltd.
Broken Hill Pty. Co. Ltd.
Central Norseman G. Corpn.
Cowarra Gold Mines
Day Dawn (New Guinea) Ltd.
Emperor Gold M. Co. Ltd.
Euratha Gold Mine Ltd.
Clutha Develop-Jubilee
Clutha Develop-Carisbrook
Golden Dyke G. M.
Golden Plateau NL
Gold M. of Kalgoorlie Ltd.
Gold Mines of Papua
Gt. Boulder Pty. G. M. Ltd.
Lady Shenton G. M.
Lake View & Star Ltd.
Lake View & Star (Retreatment)
Lancefield (W.A.) G. M.
Loloma (Fiji) G. M.

AUSTRALASIA (Continued)
Marvel Loch G. Develop.
Maryborough Gold NL
Mount Coolan Gold M.
Mount Kasi Mines, Ltd.
New Guinea Goldfields, Ltd.
New Occidental G. M.
Norseman Gold Mines
No. Kalgurli (1912) Ltd.
Paringa M. & Explor. Co. Ltd.
Quartz Mountain
Raub Australian Gold M.
Rutherglen Gold Dumps
So. Kalgurli Consol. Ltd.
Sulphide Gold (Junction Reefs)
Triton Gold Mines
Western Australian M & Explor.
Wiluna Gold M. Ltd.
Youanmi Gold Mines, Ltd.

MEXICO:
Amajac Mines Co.
Alvarado M & M Co. (AS&RCo.)
American S&R. (Am. Smelters)
American S&R. (San Diego Mill)
Amparo Mining Co.
Braschi, Victor M.
Cia, Asarco Mine
Cia. Min. Chontalpan y Anex.
Cinco Minas Company
Cubo M & M Co.
Cia. Min. las Dos Estrellas
El Arco Mines Co.
El Oro M & Rly. Co. Ltd.
Cia. Min. El Potrero S.A.
El Rayo M & Develop. Co.
Esperanza Mining Co.
Fresnillo Company
Gto. Consol. M & M Co.
Gto. Reduction & M Co.
Cia. Min. Explot. y Benef. de Gto.
Cia. Min. y Benef. de Inde
Cia. Int. de Fund. y Minerales
Cia. Min. Kildun y Anexas
Cia. de Minas La Blanca y Anex.
La Fe Mining Co. Ltd.
Cia Min. y Benef. de Maravillas
The Mazapil Copper Co. Ltd.
The Mexican Corpn. S. A.
Mexican Candelaria Co. S. A.
The Mexico M. of El Oro, Ltd.
Cia. Benef. de Pachuca S. A.
Cia. Min. Pedregal y Anexas
Cia. Minera Penoles, S. A.
Pittsburgh Vetagrande M. Co.
Cia. Min. Explot. de Promontorio
Cia. de Real del Monte y Pachuca
San Luis Mining Company
Mina San Martin
Cia. Min. de San Patricio S. A.
Neg. Min. de San Rafael y Anexas
Cia. Min. de Santiago y Anexas
Cia. de Santa Gertrudis, S. A.
Santo Domingo M. Co.
West Mexican Mines, Ltd.

PHILIPPINE ISLANDS:
Antamok Goldfields M. Co.
Antipolo Mining Co.
Atok G. M. (Big Wedge M.)
Baguio Gold M. Co.
Balatoc Mining Co.
Batong-Buhay G. M. Inc.
Benguet Consol. M Co.
Demonstration G. M. Ltd.
Elizalde & Co. Inc.
East Mindanao M. Co.
Gold River Mining Co.
Itogon Mining Co.
I.X.L. Mining Co.

PHILIPPINE ISLANDS (Continued)
Masbate Consol. M. Co.
Masbate Goldfields, Inc.
Mindanao Mother Lode M.
Mine Operations (Capsay)
No. Camarines G. M. Co.
Salacot Mining Co.
Surigao Consol. M. Co.
Suyoc Consolidated M. Co.
Tuba Mines
Twin Rivers G. M. Co.

GHANA:
Amalgamated Banket Areas
Ariston Gold Mines, Limited
Ashanti Adowsena Goldf.
Ashanti Goldf. Corpn.
Bibiani (1927) Ltd.
Gold Coast Banket Areas
Konongo Gold M. Ltd.
Marlu G. M. Areas Ltd.
Obuom Gold M. Ltd.
So. Banket Areas, Ltd.
Taquah & Abosso M. Ltd.

KENYA COLONY:
Kimingini G. M. Co. Ltd.
Macalder M. Ltd.
Rhamba Mines, Ltd.

SOUTH AFRICA:
City Deep, Limited
Geduld Pty. M. Ltd.
Brakpan M. Ltd.
Spring Mines, Ltd.
T. Andrews & Sons
The Shamva Mines Ltd.
New States Areas, Ltd.
New Modderfontein G. M.
Village Deep Ltd.
Consol. M. Reef M. & Estates
Durban Roodepoort Deep
West Spring M. Ltd.
Crown Mines, Ltd.
Modderfontein "B" G. M. Ltd.
Modderfontein East Ltd.
Transvaal G. M. Estates
Sub Nigel Limited
West Rand Consol. M. Ltd.
The Lonely Reef G. M. Ltd.
The Mayfair G. M. Ltd.
The Wanderer Consol. G. M. Ltd.
New Consort G. Mines, Ltd.
Robinson Deep Limited
East Geduld Mines, Ltd.
Daggafontein Mines, Ltd.
Ranfontein Estates G. M. Ltd.
Van Ruyn G. M. Estate, Ltd.
The Nigel G. M. Co. Ltd.
Rietfontein Consolidated M. Ltd.
Bushtick (1934) Limited
Rand Leases (Vogelstruisfontein)
Vogelstruisbult G. M. Areas, Ltd.
East Rand Pty. M. Limited
Village Main Reef G. M. Ltd.
Dominion Reefs (Klerksdorp) Ltd.
Van Dyk Consolidated M. Ltd.
East Champ D'or G. M. Ltd.
Phoenix Prince G. M. Co. Ltd.
Princeton Mine
So. African L. & Explor. Co.
Transvaal Chamber of Mines
The Bernheim G. M. Co. Ltd.
The Carrig Gold M. Ltd.
Fred Mine (Rhodesian C. Ltd. Bul.)
Maid of the Mountains (Pty.) Ltd.
New Machavie Gold Mines Co. Ltd.
Rezende Mines, Limited
Sheba Dumps Proprietary Ltd.
Sherwood Star G. M. Co.
So. Roodepoort Main Reef Areas, Ltd.

ARGENTINE:
Lavaderos de Oro Rio Achavil

BRAZIL:
Leao Junior & Cia.
Ouro Preto G. M. of Brazil
St. John del Rey Mining Co.

CHILE:
Cia. Aurifera Capote de Paulino
Caja de Credito Minero
Soc. Min. Elisa de Bordos

COLOMBIA:
Colombian Corporation Ltd.
Svenska Diamant
The Tabano Mining Company
Timmins Ochali Mining Co. Ltd.

HONDURAS:
Cia. Min. Agua Fria, S.A.
New York & Honduras Rosario M. Co.

ECUADOR:
South American Development Co.

NICARAGUA:
Empresa Minera de Nicaragua
Cia. Minera La India
La Luz Mines Ltd.
Cia. Minas Matagalpa
Neptune Gold M. Co. (A.S.&R.Co.)
Cia. Min. de San Gregorio

PERU:
Cia. Min. Alpacay, S. A.
Cia. Min. Aryabamba, S. A.
Cia. Aurifera Buldibuyo Ltda.
Cia. Aurifero Caraveli
Cia. Explor. Cotabambas
Cia. Minera Nacional S. A.
Cia. Aurifera Nazca
Sind. Min. de Parcoy
Cia. Aurifera Saramarca

TANGANYIKA:
Geita Gold Mines Ltd.

VENEZUELA:
Goldfields Am. Develop. (Botanamo)
Cia. Francesa de la Mocupia
New Goldfields of Venezuela

The United States patent system, and those of foreign countries, provide vital protection for invention and development, and incentive toward efforts in those directions. Mr. Merrill, through his experience, became a great believer in the patent system. He stated repeatedly and firmly that his contributions to science, engineering and economic welfare could never have been achieved without the protection which the patent system afforded in the early stages of his engineering developments. The number of patents issued to Mr. Merrill and his associates all over the world will, it is believed, be of interest to the layman:

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